

# THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by David Williams, Nos. 96, 98, 100 & 102 Reade St., New York.

Vol. LII: No. 12. New York, Thursday, September 21, 1893

\$4.50 a Year, including Postage.  
Single Copies, Ten Cents.

Reading Matter Contents.....page 542  
Classified List of Advertisers.... " 103  
Alphabetical Index to Advertisers " 107  
Advertising and Subscription Rates " 549



Send for circular "I" to  
**SHULTZ BELTING CO.,**  
ST. LOUIS, MO.  
NEW YORK, N. Y., 225 Pearl St., A. B. Laurence, Mgr.  
BOSTON, MASS., 184 Summer St., G. J. Kelley, Mgr.  
PHILADELPHIA, PA., 129 N. 8d St., J. Garnett, Mgr.

## TUDOR IRON WORKS

ST. LOUIS,  
Manufacturers of  
MINING RAILS, SPIKES,  
TRACK FASTENINGS.

Every Hardware and Mill Supply Dealer  
Should Sell Bristol's Patent



**BRAIDED CORD.**  
Send for Samples.  
Sash Cord, Bell Cord,  
Clothes Lines, Masons' Lines.  
**SAMSON CORDAGE WORKS, Boston, Mass.**



Send for Catalogue and Trade Discounts.

**"COPPERIZED C. R. SWEDOH  
STEEL OILERS"**  
TRADE MARKS  
REGD  
99  
ALL SIZES &  
STYLES  
BURNISHED FINISH  
CHEAP & ELEGANT  
SCALE 1-12 SIZE  
No. 210  
No. 12  
No. 14  
No. 16  
No. 18  
No. 20  
No. 22  
No. 24  
No. 26  
No. 28  
No. 30  
No. 32  
No. 34  
No. 36  
No. 38  
No. 40  
No. 42  
No. 44  
No. 46  
No. 48  
No. 50  
No. 52  
No. 54  
No. 56  
No. 58  
No. 60  
No. 62  
No. 64  
No. 66  
No. 68  
No. 70  
No. 72  
No. 74  
No. 76  
No. 78  
No. 80  
No. 82  
No. 84  
No. 86  
No. 88  
No. 90  
No. 92  
No. 94  
No. 96  
No. 100

LARGE STOCK, BEST OF GOODS & FACILITIES  
**THE WILMOT & HOBBS MFG. CO**  
HOT & COLD ROLLING MILLS AND FACTORIES  
BRIDGEPORT, CONN. U. S. A.  
**STORE, 20 MURRAY ST. NEW YORK.**

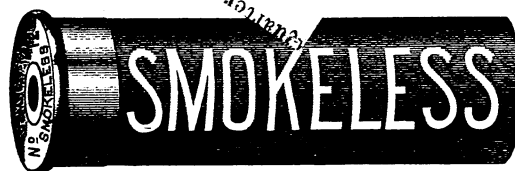
Dealers will find it to their advantage to place  
a large stock order early, as they will be ex-  
ecuted in the order in which they are received.  
This is the best selling line of Oilers ever pro-  
duced. See full illustrations, page 37.

## SMOKELESS PAPER SHELLS

Loaded with Powders, Schultze, E. C.,  
S. S. American Wood.

—SOLD EVERYWHERE—

SALMON



COLOR.

Made in 10, 12 and 16 gauge. Price-list on application.  
Packed 25 in a box, 500 in a case.

MANUFACTURED BY

**The Union Metallic Cartridge Co.,**  
BRIDGEPORT, CONN.

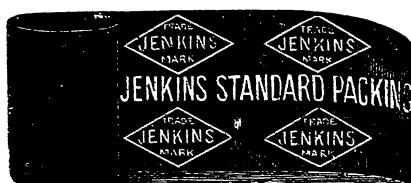
**RANDOLPH & CLOWES,**  
WATERBURY, CONN.,

Manufacturers of Seamless Drawn Brass and Copper Tubing and Large Shells, Brazed  
Tubes and Mouldings, Sheet Brass, Sheet Copper, German Silver.

—SOLE MANUFACTURERS OF—

**Brown's Patent Seamless Drawn Copper House Boilers.**  
**CANNOT COLLAPSE. WILL NOT LEAK.**

Ordinary weight tested to 200 lbs., extra heavy to 300 lbs. pressure per square inch. Made of two Seam-  
less Drawn Copper Shells. Handsomest, best and strongest and safest boiler in the market and cheapest in  
the end. Send for circular and instructions to prevent accidents from freezing, &c., &c.



**JENKINS' STANDARD PACKING**

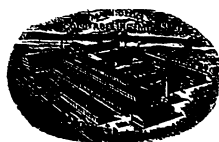
For Steam or Joint Packing has no superior. It  
is manufactured in all thicknesses. It is not  
loaded to increase weight. Does not ROT or  
BURN OUT. Every sheet is stamped with Trade  
Mark, like cut.

**JENKINS BROS.,**

New York, Philadelphia, Boston and Chicago.

**THE WILMOT & HOBBS MFG. COMPANY,**

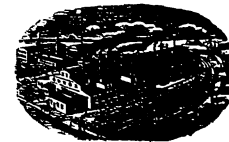
MAIN OFFICE, MILLS AND FACTORIES AT  
**BRIDGEPORT, CONN.**  
STORE, 20 MURRAY ST., NEW YORK.  
(CONNECTED BY TELEPHONE.)



Annual Capacity 15,000 Tons  
Cold Rolled Steel.

**BESSEMER, OPEN HEARTH,**  
And the Celebrated and Unequaled

**"SWEDOH"**  
(REGISTERED TRADE-MARK.)



Annual Capacity 30,000 Tons  
Hot Rolled Steel.

**HOT and COLD ROLLED STEEL.** Sheet, Band and Strip

Used for all Pressed, Stamped and Drawn Work. Easily Brass, Copper, Bronze or Nickel Plated, Tinned  
or Japanned. Furnished with plain Blue, Pickled, Annealed or Bright Surface, and with Round  
Edges or Sheared to Exact width, Coiled or Cut to Lengths, and in any Degree of Stiffness or  
Ductility required. SEND FOR NEW STEEL DEPARTMENT PAMPHLET. For samples of the difficult  
stamped and drawn work which can be made from "Swedoh" Steel, call at any Hardware  
Store and ask to be shown our "Anti-Rust Copperized C. R. SWEDOH Steel OILERS."

**Rainey Connellsville Furnace and Foundry Coke.**

The only Coke you can buy and know you are getting the best that can be manufactured. All our works in  
the heart of the Region, within four miles of Connellsville, Pa.

**CAPACITY, 3,000 TONS DAILY.**

**W. J. RAINEY,**

MAIN OFFICE:  
Mercantile Bank Building.

**CLEVELAND, OHIO.**

THE  
**ANSONIA BRASS**  
AND **COPPER CO.**  
MANUFACTURERS OF  
**BRASS AND COPPER**  
Seamless Tubes, Sheets, Rods and Wire.

**Ingot Copper.**

SOLE MANUFACTURERS

**Tobin Bronze**

(TRADE-MARK.)

Condenser Plates, Pump Linings, Wire, Round,  
Square and Hexagon Bars, for Pump  
Piston Rods and Bolt Forgings.

19 & 21 Cliff Street, - - New York.

THE  
**New Haven Copper Co.,**

SOLE MAKERS OF

**POLISHED COPPER**

Under Patent of T. James, Sept. 12, 1876.

ALSO MANUFACTURERS AND

DEALERS IN

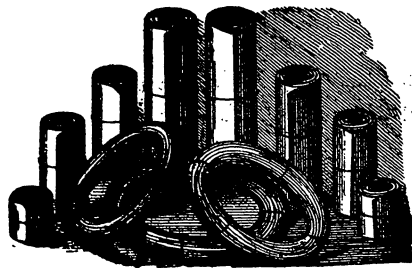
**BRAZIERS' & SHEATHING COPPER.**

Kettles, Bottoms, Bolts, Circles, &c.,

ALSO MANUFACTURERS OF

Cast Steel Angers and Bits of Superior Quality.

294 Pearl St., NEW YORK.



**Waterbury Brass Co.**

Established 1845.

**Sheet, Roll and Platers' Brass,**

German Silver, Copper, Brass and Ger-  
man Silver Wire, Brass and  
Copper Tubing,

**COPPER RIVETS AND BURS**

**PERCUSSION CAPS,  
TAPE MEASURES,  
METALLIC EYELETS,**

Brass Kettles, Brass Tags, Powder Flasks,  
Shot Pouches, &c.,

AND SMALL BRASS WARES OF EVERY DESCRIPTION.  
HICK'S PRIMERS. BERDAN PRIMERS.

*Cartridge Metal in Sheets or  
Shells a Specialty.*

Sole Agents for the CAPEWELL MFG. CO.'S  
Line of Sporting Goods.

DEPOTS:

296 Broadway, New York, 125 Eddy St., Prov-  
dence, R. I.

MILLS AT WATERBURY, CONN.

**JOHN DAVOL & SONS,**

AGENTS FOR

Brooklyn Brass & Copper Co.,

DEALERS IN

INGOT COPPER, SPELTER, LEAD, TIN,  
ANTIMONY, SOLDER & OLD METALS,  
100 John Street, - New York.

Iron and Steel. The Journal of the Iron and Steel  
Institute. No. 2, 1892. 584 pages, with 27 plates.  
\$6.00

For Sale by DAVID WILLIAMS, 96-102 Reade St., N. Y.

**THE CELEBRATED ACID RESISTING DEOXIDIZED BRONZE**  
IN INGOTS OR CASTINGS, AND

**DEOXIDIZED BABBITT METALS.**

BEST IN THE WORLD.

Large Castings a Specialty.

Bridgeport Deoxidized Bronze and Metal Co.,  
BRIDGEPORT, CONN.

**MATTHIESSEN & HEGELER ZINC CO.,**

LA SALLE, ILLINOIS,

**SMELTERS OF SPELTER.**

AND MANUFACTURERS OF

**SHEET ZINC AND SULPHURIC ACID.**

Special Sizes of Zinc cut to order. Rolled Battery Plates.

Selected Plates for Etchers' and Lithographers' use.

Selected Sheets for Paper and Card Makers' use.

Stove and Washboard Blanks.

**ZINCS FOR LECLANCHE BATTERY.**

**BRASS GOODS MFG. CO.,**

Mfrs. of Stamped Brass, Silver and Nickeled Goods, Brass Labels for Cans and Rubber Moulds,

**BRONZE DOOR KNOBS**

Bronze and Plated Roses, Combined Rose and Escutcheon Plates, Socket Shells, &c., Patent Mirror Pin  
Cushion Business Cards, Mucilage Brushes. Novelties of new design made to order.

SALESROOM: 88 Chambers St., New York. FACTORY: 86-92 Third St., So. Brooklyn.

**HENDRICKS BROTHERS,**

Proprietors of the

**Belleville Copper Rolling Mills,**

Manufacturers of

**Braziers', Bolt and Sheathing**

**COPPER.**

**COPPER WIRE AND RIVETS.**

Importers and Dealers in

Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.  
49 CLIFF ST., NEW YORK.

**THE PLUME & ATWOOD MFG. CO.**

MANUFACTURERS OF

**Sheet and Roll Brass**

-AND-

**WIRE,**

GERMAN SILVER AND GILDING METAL,  
COPPER RIVETS AND BURRS, COP-  
PER ELECTRICAL WIRE,

Pins, Brass Butt Hinges, Jack Chain,  
Kerosene Burners, Lamp  
Trimnings, &c.

18 MURRAY ST., NEW YORK.

71 PEARL ST., BOSTON.

90 MARKET ST., CHICAGO.

ROLLING MILL,  
THOMASTON, CONN.

FACTORIES:  
WATERBURY, CONN.

**Holmes, Booth & Haydens**

MANUFACTURERS OF

Sheet, Roll Brass, Brass and  
German Silver Wire.

**COPPER RIVETS AND BURRS**

**JACK CHAIN.**

**SEAMLESS TUBING, BRASS AND COPPER.**

Brazed Brass and Copper Tubing,  
Bare and Insulated Wire for Elec-  
tric Lighting and Street Rail-  
way Use, Lamp Goods and  
Kerosene Burners in  
great variety.

FACTORIES: 25 Park Place,  
Waterbury, Conn. New York.

**SCOVILL MFG. COMPANY,**

Manufacturers of

**BRASS**

Sheet, Wire, Tubes.

**BUTT HINGES,  
BUTTONS,  
LAMP GOODS,  
NOVELTIES.**

**PURE ALUMINUM**

INGOT AND SHEETS.

FACTORIES, WATERBURY, CONN.

DEPOTS:

458 Broome Street, New York.  
210 Lake Street, Chicago.  
29 High Street, Boston.

**WILLIAM S. FEARING.**

100 Chambers St., NEW YORK,

SELLS TO THE TRADE

Sheet Brass, Fancy Sheet Brass,  
German Silver, Copper, Brass  
and German Silver Wire,  
Brazed and Seamless Brass and  
Copper Tubes, Brass and Cop-  
per Rods, Brass Ferrules,  
Pure Copper Wire,  
Sheet and Ingot Copper, Spelter,  
Tin, Antimony, Lead, &c.

Rough Casting of Aluminum.

Aluminum Bronze, German Silver Bronze and al  
kinds of Metals. Manufacturers of Chandeliers, Meta  
Picture Frames, Ink Stands, Figures, Statues, etc.  
Stair Carpet Holders a Specialty.

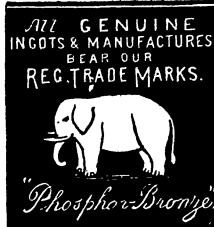
**St. Louis Bronze & Aluminum Works,**

3741-3743 North Broadway,

ST. LOUIS, MO.



**ELEPHANT  
TRADE-MARK.**



**PHOSPHOR-BRONZE**  
INGOTS, CASTINGS, WIRE, SHEET &C.  
**THE PHOSPHOR BRONZE SMELTING CO. LIMITED**  
512 ARCH ST. PHILADELPHIA PA. U.S.A.  
**ORIGINAL MANUFACTURERS OF PHOSPHOR-BRONZE IN THE UNITED STATES AND SOLE MAKERS OF "ELEPHANT BRAND" PHOSPHOR-BRONZE.**

**PHOSPHOR  
BRONZE.**

**The Wm. Cramp & Sons S. & E. B Co., PHILADELPHIA, PENNA.**

**BRASS FOUNDERS.**

YORK AND THOMPSON STS.,

SOLE MANUFACTURERS OF

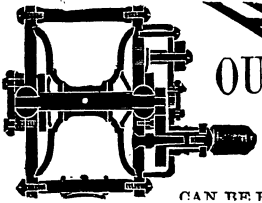
**AMERICAN MANGANESE BRONZE.**



**MANGANESE BRONZE PROPELLER WHEELS A SPECIALTY.**

Our Manganese Bronze is invaluable where Castings of great Tensile Strength are needed. In this quality it is nearer Steel than any other alloy in the market, and in appearance the castings are unequaled.

*We Make Larger Castings and More of Them than Any Competitor.*



**HENDRYX**  
EVERY REEL WARRANTED.  
**ROUTING** says of Hendryx patented Adjustable Globe Bearing Aluminum Reels, "perfectly constructed and beautifully finished in every part, these Reels work as truly as watches." Actual weights, Single Action, 2½ ounces; Multiplying, 4½ ounces; Quadruple, 4½ ounces.

THE ANDREW B. HENDRYX CO., NEW HAVEN, CONN., U. S. A.

CAN BE PURCHASED FROM ANY FIRST-CLASS DEALERS IN FISHING TACKLE.

**BRASS, BRONZE,  
COMPOSITION and  
ALUMINUM  
CASTINGS, Heavy and Light.**

**F. L. GAYLORD CO.**

ANSONIA,  
CONN.

Send  
for  
Prices.

**GENUINE  
PHOSPHOR TIN,**  
MANUFACTURED BY THE  
**CROSBY STEAM CAGE  
AND VALVE CO.**  
Boston, Mass., U. S. A.  
Branches: NEW YORK, CHICAGO AND LONDON.

The Phosphates of America. Where and how they occur; how they are mined; and what they cost. With practical treatises on the manufacture of sulphuric acid, acid phosphate, phosphoric acid and concentrated superphosphates, and select methods of chemical analysis. By FRANCIS WYATT, Ph.D. Cloth, profusely illustrated... \$4.00  
For Sale by DAVID WILLIAMS, 96-102 Reade St., N. Y.

**THE CRESCENT TRY IT!**  
AND YOU WILL USE NO OTHER  
**THE CRESCENT BRAND  
PHOSPHOR  
TIN.**  
THE HIGHEST AND  
RICHEST GRADE MADE.  
MANUFACTURED ONLY BY  
**THE CRESCENT PHOSPHORIZED METAL CO.**  
OFFICE AND WORKS  
2107 2109 AND 2111 INDIANA AV. PHILADELPHIA, PA.

**CROWN SMELTING COMPANY,**  
Chester, Pa.  
**Bronze, Brass and Composition Castings.**  
Inventors and Sole Manufacturers of  
**"Crown Bronze" Bearing Metal and "Crown ROLLING MILL Babbitt Metal."**  
Manufacturers of **PHOSPHOR-BRONZE TO PENNSYLVANIA RAILROAD.**  
Specifications in ingot metal or castings.

**THE COST OF MANUFACTURES  
—) AND THE (—  
ADMINISTRATION OF WORKSHOPS,  
Public and Private.**

**BY CAPT. HENRY METCALFE.**

**322 Pages; 6¼ x 9½ inches.**

**CLOTH, \$5.00**

This work is an effort to correct some of the wrong, and consequently unprofitable, methods of conducting manufacturing establishments, and proposes plans for more correct ones. A system of mechanical bookkeeping, based on the card catalogue method, dispensing with the use of books, by which the cost of manufactures may be promptly determined, either in gross or detail, as to component parts and operations thereon. Comprising a simple method of recording all dealings with material which relate to its procurement, expenditure or possession. Applied, with numerous practical illustrations, to the trust, accountability for public property and funds required of the U. S. Ordnance Department, with a review of its present practice. Illustrated with tables, forms of cards, etc.

Any Book Published Sent, Post-paid, on Receipt of the Price, by

**DAVID WILLIAMS, Publisher and Bookseller**  
96-102 Reade Street, New York.

**PHOSPHOR-TIN**  
BY USING MY PHOSPHOR TIN MANUFACTURERS CAN MAKE ANY DESIRED GRADE PHOSPHOR BRONZE THEMSELVES BY THE SIMPLE PROCESS OF MELTING, MUCH CHEAPER THAN THEY ARE NOW TO BE HAD IN THE MARKET. NEW OR OLD COPPER CAN BE USED. FOR CIRCULARS AND PRICE ADDRESS **HALK & NAUMANN** NEW-YORK  
SOLE AGENTS FOR THE U.S. AND CANADA. 8 PEARL

**BARBED WIRE,  
PLAIN WIRE  
AND WIRE NAILS.**

**Quick Shipment. Write for Prices.**

**Indiana Wire Fence Co.,**  
Crawfordsville, Ind.

**WASHBURN & MOEN MANUFACTURING CO.,**

Worcester, Mass. New York City. Chicago. San Francisco. Houston, Texas. Waukegan, Ill.

MAKERS OF IRON, STEEL AND COPPER.

**EVERY VARIETY OF WIRE FOR ALL PURPOSES.**  
**PATENT STEEL WIRE BALE TIES.**

Wire Rope and Cable, Hard and Soft Drawn Copper Wire for Electrical Purposes, Galvanized Iron and Steel Telegraph and Telephone Wire, Glidden Patent Steel Barb Wire, Watch and Clock Main Springs, Eye-glass Springs, Steel Wire for Needles and Drills.

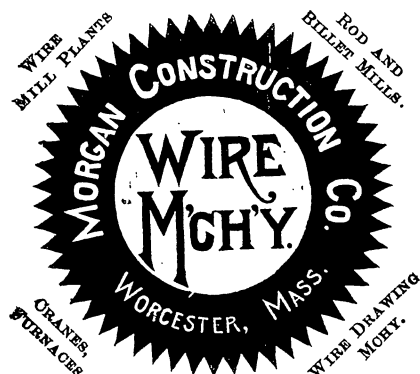


Pump Chain, Two Strand Twisted and Flat Twisted Fence Wire without Barbs, Fence Staples, Stretchers, &c.

Bright, Annealed, Tinned, and Galvanized and Copper Wire, on Spools, 1 oz. to 1 lb.

Send for Price-lists, Circulars and Descriptive Pamphlets.

Warehouses: New York, 16 Cliff St. Chicago, 107 & 109 Lake St. San Francisco, 8 & 10 Pine St. Houston, Texas.

**The American Metal Co.**

(LIMITED),

Levin Building, 80 Wall St., New York.  
P. O. BOX 957.

COPPER, COPPER ORES AND MATTES.

TIN, LEAD, SPELTER, ANTIMONY, NICKEL,  
ALUMINUM, BULLION, IRON.

Advances made on Consignments.

AGENTS FOR

Henry R. Merton & Co., - - London.  
Metallgesellschaft, Frankfurt-on-Main.  
Williams, Foster & Co., Ltd., Swansea.

**AMERICAN SPIRAL SPRING CO.**

MANUFACTURERS OF

**ALL KINDS OF SPIRAL SPRINGS.**

OFFICE AND WORKS:

Shingiss and Bluff Streets, - PITTSBURGH, PA.  
TELEPHONE 705.

**WM. MCFARLAND,**  
**IRON FOUNDER,**

TRENTON, - - N. J.

**Chilled Cast Wire DIES**

A SPECIALTY.

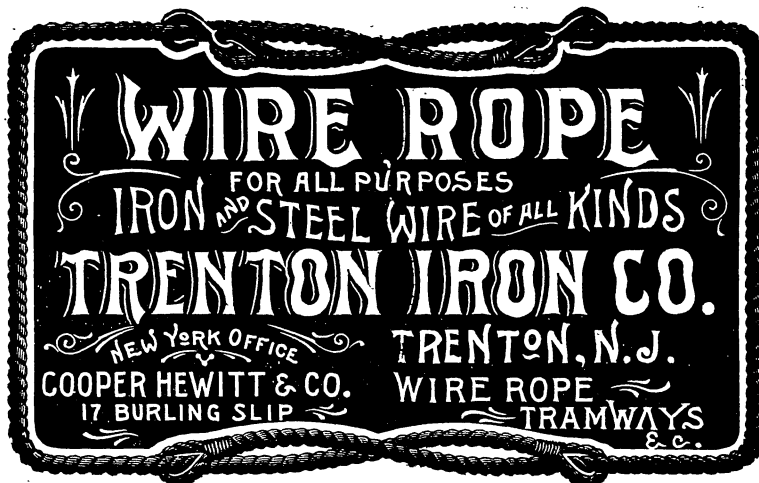
Any Size or Style Made at Short Notice.



Guaranteed.  
Best Anti-Friction Metal for all machinery bearings. For high speed and heavy crushing weight it has no equal. Introduced in this country since 1891 and has displaced all Anti-Friction metals it has come in contact with. Stereotype and Electrotype Metal.

THEODORE HIERTZ &amp; SON, SOLE MFRS.,

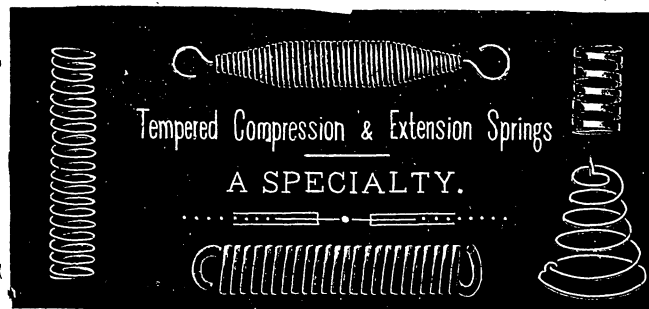
Manufacturers Babbitt Metals, Solder, Lead Seals, &c.  
40th St. & Park Ave., St. Louis, Mo.

**MILLER & VAN WINKLE,**

MANUFACTURERS OF

**STEEL WIRE AND STEEL SPRINGS.**

TEMPERED STEEL WIRE.



MACHINERY SPRINGS.

OFFICE AND WORKS: } BROOKLYN, N. Y.  
18 to 24 Bridge Street,

VOLUTE,  
WIRE  
and  
FLAT STEEL

**SPRINGS**

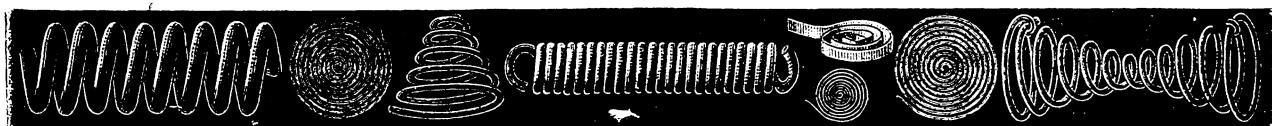
& Agricultural Implements, Machinery and various other purposes.  
Write for prices to

**SABIN MACHINE CO.,**  
MANUFACTURERS,  
MONTPELIER, VT



117th to 118th Street and Harlem River.

General Offices, Foot 118th Street, New York.



Makers of Iron, Bessemer, Siemens-Martin and Crucible Cast Steel Wire of all kinds, annealed, soft and hard drawn; Coppered Spring Wire for Furniture Springs, &c., Coppered Soft Wires, Baling Wires, Suspension Bridge and Rope Wires of all kinds, &c.

## STEEL MUSIC WIRES and MUSIC SPRING WIRES,

UNRIVALED FOR PIANOFORTE STRINGS.

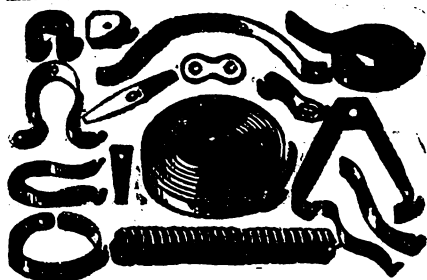
FOR THE HIGHEST CLASS OF SPRINGS.

Specialty of finest Cast Steel Wires, round, flat, square and any other shape, tempered and also in the soft state, guaranteed to harden and temper. Solid Rib and Paragon Umbrella Wires. Crinoline, Corset, Shade Roller, Lock, Hat, Brush, Saw, Band Saw, Clock Spring, Clock Bell, Clock Verge and Watch Spring, Rule and Tape Line and Eyeglass Wires, &c. Piano, Needle, Fish Hook, Drill and Hair Spring Wires. Special Cast Steel Wires of any kind made for special purposes. Also Covered Wires—Braided and Cloth and Paper Covered—for crinoline, corset and other purposes. Cold Rolled and Slit soft and Tempered Steel Strips of all kinds and for all purposes.

Special Wires and Springs of Every Description.

CORRESPONDENCE SOLICITED.

SAMPLES FURNISHED ON APPLICATION.



DUNBAR BROS.,

Manufacturers of

Clock Springs and Small Springs

of every description, from best Cast Steel,

BRISTOL, CONN.

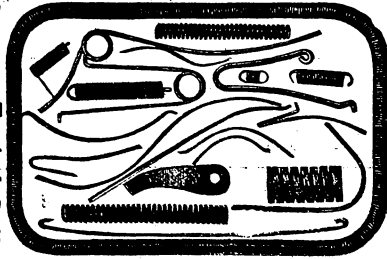
FRED NOURSE CO.,



STEEL WIRE AND STEEL SPRINGS,

315, 317 and 319 East 22d St., New York.

TUCK M'F'G CO., Brockton Mass



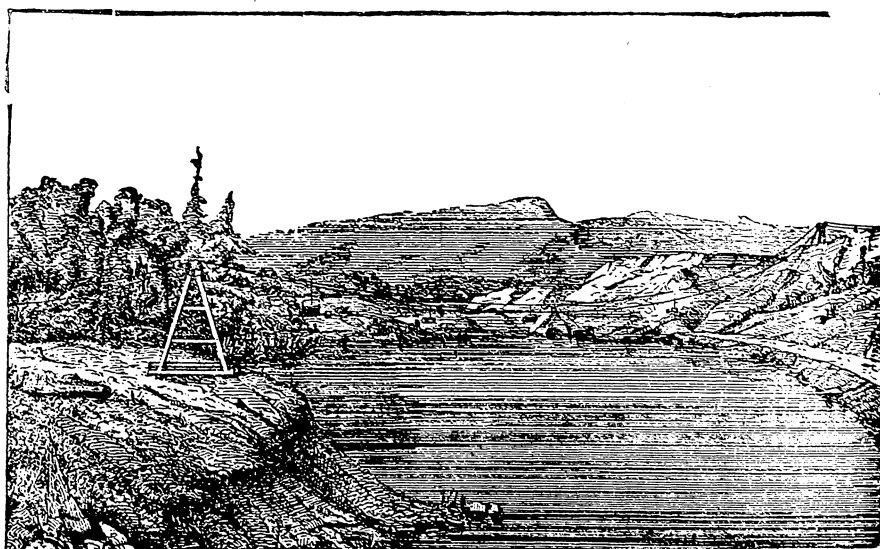
Send for Catalogue.

Tempered Springs of all kinds.

## CALIFORNIA WIRE WORKS,

9 Fremont Street.

San Francisco, Cal.



MANUFACTURERS OF

WIRE ROPE FOR CABLE RAILWAYS AND MINING PURPOSES.

HALLIDIE'S PATENT WIRE ROPEWAY,

Simplest and most economical means of transportation. Send for Illustrated Catalogue.

THE CELEBRATED

"SILVER FINISH"

GALVANIZED POULTRY NETTINGS.

FOR SALE BY THE HARDWARE TRADE.

GET THE BEST.

Always  
Ask  
For



Unequaled for Strength  
and Durability.

Made Only by

Broderick & Bascom Rope Co.,  
St. Louis, Mo.

HOWSON  
AND  
HOWSON

Counsellors at Law  
Solicitors of Patents

PHILADELPHIA  
Forrest Building, 119 S. 4th St.  
NEW YORK  
Potter Building, 38 Park Row.  
WASHINGTON  
Atlantic Building, 928 F St.

## PATENTS

U. S. and Foreign Secured.

Trade Marks and Copy Rights. Twenty Years' Experience. Send model or sketch and brief description of your invention for Free report as to patentability. Expert searches and opinions as to Scope, Validity and Infringement. Patent Causes Prosecuted and Defended. Practice in U. S. Supreme, Circuit and Circuit Appeals Courts, and U. S. Patent Office.

Send for "Plain Words about Patents." Free.

PATENT PRACTICE EXCLUSIVELY.  
References Furnished on Application.

E. B. STOCKING, Attorney at Law,  
611 F ST., N. W., WASHINGTON, D. C.

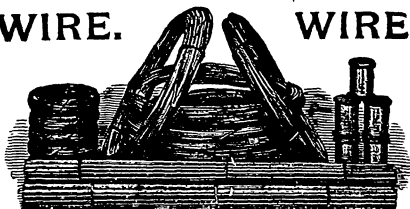
## PATENTS.

H. W. T. JENNER, Patent Attorney and Mechanical Expert. 519 Seventh St., Washington, D.C. Charges moderate. Write for terms. Established 1883.

GEO. W. PRENTISS & CO  
HOLYOKE, MASS.,

—MANUFACTURERS OF—

WIRE. WIRE



Bright, Coppered, Annealed and Tin Plated.  
Finished to order, round, square, oval or flat.

TINNED WIRE OF ALL SIZES A SPECIALTY

## SPRINGS—RIVETS.

Specialties in

SHEET METAL WORK,  
CLOCK and INDICATOR POINTERS,  
CLARK & COWLES. Plainville, Ct.

PHILLIPS, TOWNSEND & CO.,  
North Penn Junction, Philadelphia.

## WIRE NAILS, - - - - - NORWAY RIVETS.

Rivets marked "P" are not of our make. We make only first-class NORWAY IRON RIVETS

## A. LESCHEN & SONS' ROPE CO.

MANUFACTURERS OF



ST. LOUIS, MO.

CORRESPONDENCE INVITED.



Williamsport Wire Rope Co., Williamsport, Pa.



WAREHOUSES: 87 Liberty St., New York.

WORKS  
Wilkesbarre, Pa.

**PROMPT SHIPMENTS OF**  
GENERAL WIRE HARDWARE AND KITCHEN FURNISHING GOODS  
**SPECIALTIES**  
MANUFACTURED TO ORDER.  
EVERYTHING IN WIRE.  
THE WIREGOODS COMPANY, - WORCESTER, MASS.

NEW HAVEN WIRE MFG. CO.,  
**WIRE** in great variety.  
NEW HAVEN. CONN.

## Wire Cloth AND Wire Goods

Hardware Grade and  
Fanning Mill Wire Cloth,  
Poultry Netting, Heavy  
Window Screen Wire  
Cloth, Coal and Sand  
Screens, Riddles, Ash  
Sieves, &c., &c.



Office and Counter  
Railings, Elevator En-  
losures, Wire Stall  
Guards, Hay Racks  
Feed Boxes, Window  
Guards, &c., &c.

BUFFALO, N. Y.

## BOOKS

THE NEWEST BOOKS ON Metal Working, Iron, Steel and Metallurgy; Mining, Mechanical and Civil Engineering; Casting and Founding; Electricity and Electric Lighting; Draftsmanship. Architecture and Building, promptly supplied on receipt of price. SEND FOR CATALOGUES, mentioning the kind of books you are looking for.

DAVID WILLIAMS, 96-102 Reade St., New York.

**HOWARD & MORSE**  
**45 FULTON ST.,**  
**NEW YORK.**  
**HEAVY MINING**  
**COPPER,**  
**BRASS,**  
**STEEL**  
**OR IRON**  
**WIRE CLOTH.**

ALSO  
 MANUFACTURERS OF  
**GENERAL**  
**WIRE WORK.**  
 Window Guards,  
 Stable Fixtures,  
**RAILINGS,**  
 Sand Screens  
 Coal Screens  
 Etc.

**Art Metal Works**  
 IN WIRE, BRASS and WROUGHT IRON.  
**BANK AND OFFICE**  
**RAILINGS**  
 In Great Variety and of Handsome Designs.  
**ELEVATOR ENCLOSURES.**  
 Iron and Wire Fences, Coal and  
 Ore Screens, Wire Cloth and Wire  
 Rope, Brass and Copper Sheets and Tubing, Plain and  
 Barbed Fencing Wire. Send for Catalogue and name this Paper.



**WICKWIRE BROTHERS,** **CORTLAND, N. Y.**  
 MANUFACTURERS OF  
**Wire Cloth and Wire Goods,**



Coal Sieves,  
 Flour Sieves,  
 Corn Poppers,  
 Dish Covers,  
 Metallic  
 Coal Sieves.

**NEW PROCESS**  
**Cortland**  
**POWER LOOM**  
**WIRE CLOTH.**  
 Every roll wrapped in Pink Paper  
 and has our name on label.

# SECURITY WAREHOUSE,

## EAST ST. LOUIS, ILL.,

Do a general storage business. Rates reasonable. Insurance low.  
 Located on B. & O. and Pennsylvania Lines.  
 Direct connection with 26 Railroads entering St. Louis or East St. Louis, and all Ohio,  
 Missouri and Mississippi River Lines.  
**St. Louis Rates** of freight to all points **West** of Mississippi River. To points **East** less.  
 In addition to storage we do a general distributing business on commission. We have rep  
 resentatives traveling all over the West and South.  
 Correspond with us.

**BOOKS** { THE NEWEST BOOKS ON Iron, Steel and Metallurgy  
 Mining, Mechanical and Civil Engineering; Casting and  
 Founding; Electricity and Electric Lighting, promptly  
 supplied on receipt of price by  
**DAVID WILLIAMS, 96-102 Reade St., New York.**

## Architectural Iron and Steel and Its Application in the Con- struction of Buildings.

*Fully Illustrated with Engravings from  
 Original Designs.*

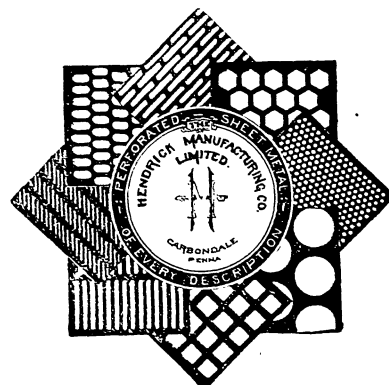
### GENERAL CONTENTS:

Chapter I. THE MANUFACTURE OF IRON AND  
 STEEL. Articles 1 to 24.  
 Chapter II. FLOORS. Articles 25 to 51.  
 Chapter III. GIRDERS. Articles 52 to 66.  
 Chapter IV. CAST IRON LINTELS. Articles 67  
 to 76.  
 Chapter V. TRUSSES. Articles 77 to 90.  
 Chapter VI. STRUTS. Articles 91 to 101.  
 Chapter VII. CAST IRON COLUMNS. Articles  
 102 to 118.  
 Chapter VIII. WROUGHT IRON COLUMNS  
 Articles 119 to 124.  
 Chapter IX. STAIRWAYS. Articles 125 to 139.  
 Chapter X. ORNAMENTAL IRON. Articles 140  
 to 146.  
 Chapter XI. ELEVATOR ENCLOSURES. Articles  
 147 to 150.  
 Chapter XII. DOORS AND SHUTTERS. Articles  
 151 to 160.  
 Chapter XIII. FLOOR LIGHTS AND SKYLIGHTS.  
 Articles 161 to 165.  
 Chapter XIV. HOLLOW BURNT CLAY. Articles  
 166 to 167.  
 Chapter XV. ANCHORS. Articles 168 to 177.  
 Chapter XVI. BOLTS. Articles 178 to 188.  
 Chapter XVII. PRACTICAL DETAILS ILLU-  
 STRATED. Articles 189 to 239.  
 Chapter XVIII. FINISHING IRON. Articles  
 240 to 246.  
 Chapter XIX. SPECIFICATIONS.  
 Chapter XX. TABLES.  
 Chapter XXI. SELECTED PAPERS ON IRON  
 WORK, FROM THE NEW YORK BUILDING  
 LAW, 1891.

By WILLIAM H. BIRKMYRE,  
 8vo Cloth, - - \$3.50.

SENT POST-PAID BY  
 DAVID WILLIAMS, Publisher and Bookseller,  
 96-102 Reade St., N. Y.

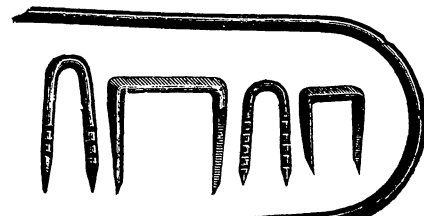
## PERFORATED SHEET METALS OF EVERY DESCRIPTION.



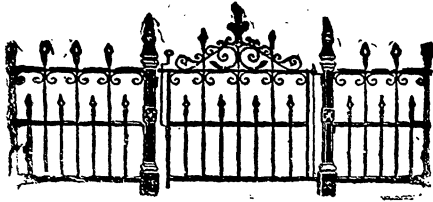
THE HENDRICK MFG. CO., LTD.,  
 CARBONDALE, PA.

**E. H. Titchener & Co.,**  
 BINGHAMTON, N. Y.

—MANUFACTURERS OF—



**STAPLES in All Varieties,**  
 Double-Pointed Tacks, Bed Links, Etc.  
**Blind Staples a Specialty:**



## Reliance Wire & Iron Works, MILWAUKEE, WIS.

ARCHITECTURAL WIRE AND IRON WORKERS.

Wire Cloth, Galvanized Fencing and Netting, Wire Lath, Wire and Iron Fences and Railings, Window Guards, Stable Fixtures, Bank and Office Railings, all kinds of Brass, Wire and Iron Work for Buildings and Offices.

SEND FOR ILLUSTRATED CATALOGUE.



# CLINTON WIRE CLOTH CO.,

— Manufacturers of Every Description of —

WIRE CLOTH, HEX. NETTINGS, WIRE LATH AND FENCING.

**Perforated Metals.** GALVANIZERS AND TINNERS OF **Wire Cloth and Nettings.**

Clinton "Standard" (Number 33 Wire) Painted Window Screen Wire Cloth.

FACTORY AND GENERAL OFFICE: CLINTON, MASS.

NEW YORK, 76 Beekman Street.

BOSTON, 199 Washington Street.

CHICAGO, 137 Lake Street

## The Gilbert & Bennett Mfg. Co.

— MANUFACTURE —

**WIRE CLOTH, NETTING,**  
Fencing, Gates, Fencing Tools,  
**Wire Goods, Wire Work**

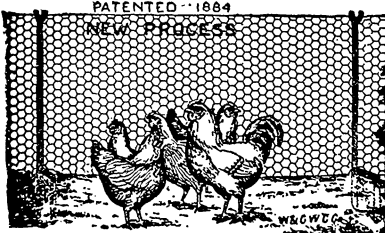
RAILINGS, WINDOW GUARDS.  
WIRE LATHING WITH HAMMOND'S METAL FURRING.

44 Cliff Street,  
**NEW YORK.**  
148 Lake Street,  
**CHICAGO.**

Factories, { GEORGETOWN, CONN.  
{ CHICAGO, ILLINOIS.  
ESTABLISHED 1818.

Pearl Window Screen Wire Cloth.  
Galvanized Steel Wire Cloth.  
Galvanized Wire Poultry Netting.  
"Cottage" Lawn & Garden Fencing.  
The World's Web Wire Fencing.  
Sieves, Riddles, Screens.  
Gilbert's Rival Ash Sifters.  
House Furnishing Wire Goods.

## WRIGHT & COLTON WIRE CLOTH CO., Worcester, Mass.



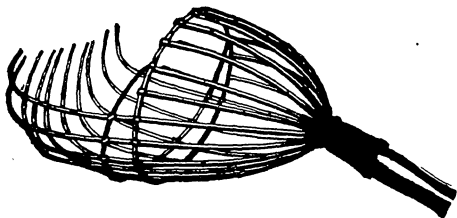
HARD STEEL WIRE

NEW PROCESS  
**HARD STEEL WIRE CLOTH AND NETTING**  
GALVANIZED  
**WIRE NETTING.** Painted Window Screen Wire Cloth,  
WIRE LATHING, HOUSE FURNISHING WIRE GOODS

Patented March, 1884.  
Patents Pending.

SEND FOR LATEST CATALOGUE.

## "PENNSYLVANIA" FRUIT PICKER.



*This Cut almost speaks for itself*—the device being so much like the human hand shows at once the utility of the article.

AS A FRUIT PICKER IT HAS NO SUPERIOR.

It is made of Heavy Galvanized Wire, and easily adjusted to a pole.

It has been sold for several years, and the demand (as it is becoming known) is steadily increasing.

The difficulty of detaching fruit and securing it unbruised is apparent to every one so engaged. This overcomes the difficulty, and saves the finest fruit, which commands the highest prices.

THE LOW PRICE AT WHICH IT IS SOLD

Brings it within the reach of those who have but little fruit to gather as well as those who have large quantities.

Price per dozen, \$6.00.

It will gather Apples, Peaches, Pears, Etc.

MANUFACTURED BY **PENNSYLVANIA WIRE WORKS,**

**EDWARD DARBY & SONS, - 233-235 Arch St., Phila., Pa.**

PAINTED AND GALVANIZED WINDOW SCREEN CLOTH.

IRON, STEEL, BRASS AND COPPER WIRE CLOTH.

MANUFACTURERS  
**THE ROEBLING  
STANDARD  
WIRE  
LATHING.**

**NEW JERSEY  
WIRE CLOTH CO.**

**"JERSEY"  
POULTRY  
NETTING  
AND FARM  
FENCING.**

TRENTON, 117 and 119 LIBERTY STREET,  
JERSEY. NEW YORK.

171 and 173 LAKE STREET,  
CHICAGO

25 and 27 FREMONT STREET,  
SAN FRANCISCO.



**FOUNDERS**  
IN BRASS AND COM-  
POSITION, HEAVY  
AND LIGHT CAST-  
INGS.

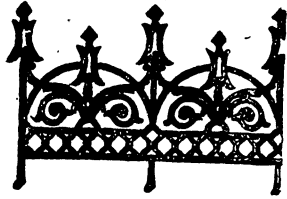
**P. P. EMORY MFG. CO.**

— ESTABLISHED 1850. —

**SPRINGFIELD, MASS.**

**Good Work, Fair Prices.**

**CORRESPONDENCE SOLICITED.**



**ROOF CRESTING.**

Builders' Wire and Iron Work, Counter Railing, Stable Fixtures, Iron Fencing, Window Guards, Columns, Stairs, Jail Cells, Etc.

**CATALOGUE FREE.**

**E. T. BARNUM, - - DETROIT, MICH.**

MENTION THIS PAPER.

**THE VAN DORN IRON WORKS CO., Cleveland, Ohio.**



Office and Salesroom, 157 1/2 Euclid Ave.,  
**MANUFACTURERS OF**

**WROUGHT IRON FENCE AND RAILING.**

Stable Fixtures, Crestings, Terminals, Wire Office and Counter Railing, Lawn Seats and Vases.

**Iron and Steel Jail Cell Work. Orna-  
mental and Structural Ironwork.**

**COPPERSMITHS,**

and Manufacturers of

**COPPER AIR CHAMBERS,**

**EXPANSION PIPES**

**AND COILS.**

**CHAMPION IRON  
COMPANY.**



The largest Iron Fence and Railing Works in the U. S.  
**KENTON, OHIO.**

**W. S. ESTEY,**

No. 65 FULTON ST., NEW YORK,

MANUFACTURER OF

**WIRE CLOTH**

Of Brass, Copper, Iron, Galvanized and Steel Wire of all meshes and grades. For Mining, Milling and all other purposes. Locomotive Spark Wire Cloth, &c.,

—AND—

**WIRE WORK**

For Bani, Office and Counter Railing, Store Fronts Window Guards, &c.

Galvanized Twist Netting.

**Oliver's Patent Decoy Rat Traps.**

S T Pat. Adjustable Foundry Riddles.

**S T Sand Screens.**

SEND FOR CATALOGUE.

**HUMANE, STRONG,  
CHEAPER  
THAN BARB WIRE  
VISIBLE  
ORNAMENTAL.**

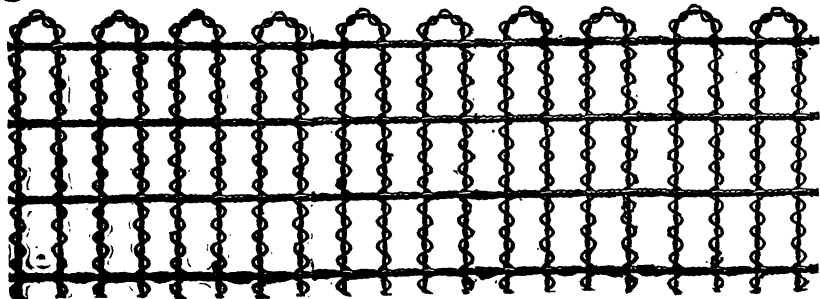
DOUBLE THE STRENGTH of any other fence; will not stretch, sag, or get out of shape. A Perfect Farm Fence, yet Handsome enough to Ornament a Lawn. Write for prices.

Descriptive Circular and Testimonials, also Catalogue of Hartman Steel Picket Lawn Fence, Tree and Flower Guards, Flexible Wire Mats, etc., FREE.

**HARTMAN MFG. CO.,**  
Ellwood City, Lawrence Co., Pa.  
Branches: 277 Broadway, New York.  
508 State St., Chicago. 51-53 S.  
Forsyth St., Atlanta, Ga.



**STEEL WEB PICKET FENCING.**



**MOST POPULAR FOR YARDS, LAWNS, PARKS, ETC.**

Write for Circular of above, and Steel Wire Fence Board.

**DEKALB FENCE CO., - - DeKalb, Ill.**

**AGENCIES:** Eastern—HICKS & DICKEY, Philadelphia, Pa. Southern—W. B. BELKNAP & CO., Louisville, Ky. Western—WYETH HARDWARE & MFG. CO., St. Joseph, Mo. Indiana and Michigan—INDIANA WIRE FENCE CO., Crawfordsville, Ind. Texas—G. K. MERIWETHER, Dallas.

**Kilmer Manufacturing Co.**

—Newburgh, N. Y.

Manufacturers of

**BALE TIES**

For Baling  
Hay, Straw,  
Rags,  
Excelsior, &c.

ALSO WIRE RODS, BARB WIRE, COILED STEEL WIRE, WIRE STAPLES, GALVANIZED WIRE, ORNAMENTAL FENCING, &c., &c.

Western Warehouse, 543 and 545 State Street, Chicago, Ill.

Western Office 21 Quincy Street, Chicago, Ill.

New York Office, 111 Water Street, New York City.

Works and General Office, Newburgh, N. Y.

**Tree Protector.**

McCallips' Pat.

The Best Tree Guard on the Market. Price \$12 per doz. Discount to the Trade.

**Iron Fences, Wire Fences  
and Builders' Wire Work.**

**McCallip Fence & Wire Works,**

485 Oak Street,

**COLUMBUS, - OHIO.**

**COBB & DREW,**

**PLYMOUTH, MASS.**

**Manufacturers of Norway Iron Rivets, Brass  
and Copper Rivets, Burrs, Washers,  
D. P. Tacks and Staples.**

New York Agency, James S. Henderson, successor to Disosway & Henderson, Hardware.

**Agents for Philadelphia Star Carriage  
and Tire Bolts.**

Corrugated, Crimped and Cap-Board Iron Roofing & Siding.



Iron Buildings, Roofs, Doors, Shutters, Cornices  
Skylights, Bridges, &c.

**MOSELEY IRON BRIDGE AND ROOF CO.,**

Office, 5 Dey Street, Room 13, NEW YORK.

# The Berlin Iron Bridge Co.,

CHAS. M. JARVIS,  
*Pres. and Chief Engineer,*

BURR K. FIELD,  
*Vice-President.*

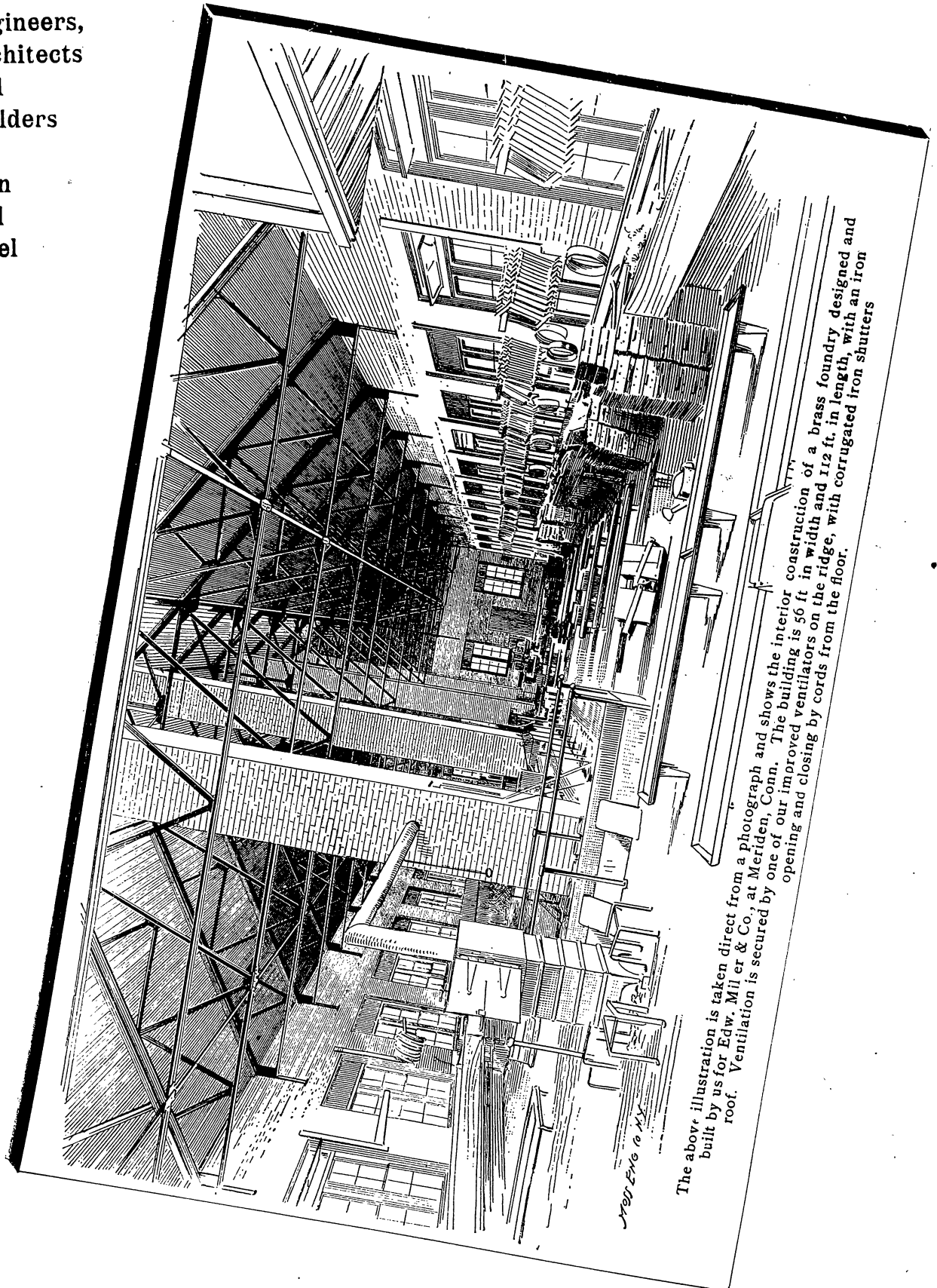
GEO. H. SAGE,  
*Secretary.*

F. L. WILCOX,  
*Treasurer.*

OFFICE AND WORKS:

**No. 5 Railroad Avenue,  
EAST BERLIN, . . . CONN.**

**Engineers,  
Architects  
and  
Builders  
in  
Iron  
and  
Steel**



The above illustration is taken direct from a photograph and shows the interior construction of a brass foundry designed and built by us for Edw. Miller & Co., at Meriden, Conn. The building is 56 ft. in width and 112 ft. in length, with an iron roof. Ventilation is secured by one of our improved ventilators on the ridge, with corrugated iron shutters opening and closing by cords from the floor.

**SEND FOR ILLUSTRATED CATALOGUE.**

**STEEL, IRON, COPPER, ZINC, BRASS AND TIN PERFORATED.**

-FOR-

Grain Cleaning Machinery;  
Woolen, Cotton, Paper Pulp, Rice,  
Flour and Oil Mills;  
Distilleries, Sugar and Malt Houses;  
Gas, Water, Brick and Tile Works, Filters, Ventilators, &c;  
Oil, Gas and Vapor Stoves, Lanterns, Lamps, etc.

Perforated Filter Press Plates

For Paraffine Wax, Cotton-Seed Oil, Sugar and other purposes.



**THE HARRINGTON & KING PERF. CO.,**  
Main Office & Works, 224 to 240 Union Street, CHICAGO, ILL., U. S. A.  
Eastern office, No 284 Pearl St., New York.

Screen Plates for Coal, Coke, and Ore Separators, Jigs, Trommels, Washers and Sizers.

Heavy Steel and Iron Plates and Cylinders for Coal and Coke Breakers, Ore, Stone, Phosphates & Gravel Screens.

For Railroads, Locomotive and Car Builders.

Prices and Samples on Application.

ALUMINUM or MANGANESE BRONZE  
**SCREEN PLATES**  
TO WITHSTAND ACTION OF ACIDULATED WATERS  
WITH  
Hardness and Life of Best Steel.

**HENDRICKS'****ARCHITECTS AND BUILDERS' GUIDE**

—:AND:—

**CONTRACTORS' DIRECTORY OF AMERICA**

—:FOR:—

*BUILDERS, CONTRACTORS, MANUFACTURERS*

AND DEALERS IN ALL KINDS OF

**BUILDING SUPPLIES.**

A Complete Directory of all the Construction Industries of the Country, containing over 170,000 Names. Addresses and Business Classifications, comprising Builders and Contractors of Material and Construction in the Building and kindred Industries. With Full lists of the Manufacturers of and Dealers in Everything employed in the Manufacture of Material and Apparatus used in these Industries—from the Raw Material to the Manufactured Article, and from the Producer to the Consumer.

Architects; Arch'l Wood Workers; Car Builders; Carpenters; Builders and Contractors of all kinds; Blast Furnaces; Brick Mfrs. (Common, Fire, Ornamental, Paving, Pressed, &c.); Boiler Mfrs.; Bridge Builders; Builders' Hardware; Mfrs. of Building Iron of all kinds; Cement; Cornices; Dumb Waiters; Engine Mfrs.; Engine and Boiler Dealers; Electric Lighting Co.'s Dynamos and Motors; Elevators; Engineers (Civil and Mechanical), Electricians; Fire Escapes; Furnaces; Fire Proof Building Material; Dredging Machinery and Contractors; Dock Builders; Contractors for Railroads (Steam, Electric, Elevated, Cable, Street, &c.); Granite Producers, Dealers and Workers; Granite and Marble Monument Workers and Dealers; Iron and Steel Ceiling and Siding; Iron and Steel Roofing; Lathing (Iron, Steel and Wire); Lightning Rods; Mantel Mfrs. (Iron, Marble, Onyx, Slate, Wood, &c.); Mantels, Grates, Fenders, Tile, &c.; Marble Producers, Marble Dealers and Workers; Mason and Builders' Materials; Paint Mfrs.; Paint, Oil and Glass Dealers; Plumbers' Specialties; Plumbers, Gas and Steam Fitters; Plumbers' Gas and Steam Fitters' Supplies; Roofers and Roofers' Supplies; Steam Supplies (Gauges, Feed Water Heaters, Traps, Valves, Pipe and Boiler Coverings, Cast and Wrought Iron Pipe and Fittings); Steam and Hot Water Heating Apparatus; House Heating Boilers and Heaters; Steam and Hot Water Heating Contractors; Railroad Purchasing Officials; Radiators; Rolling Mills, &c.; Sashes, Doors and Blinds; Skylights; Stone Dealers; Terra Cotta; Varnishes; Ventilators; Vault and Sidewalk Lights; Weather Vanes; White Lead Mfrs.; Wire Mfrs. and Workers; in fact everything connected with the Building Industries.

**FOR THE YEARS 1893-94.****PRICE . . . FIVE DOLLARS.**

SENT, POSTPAID, ON RECEIPT OF THE PRICE, BY

**DAVID WILLIAMS, Publisher and Bookseller,****96-102 Reade Street, N. Y.**

**ATLAS TACK CORPORATION.**

508 SEARS BUILDING, BOSTON, MASS., U. S. A.

**BRANCHES:** { **DUNBAR, HOBART & CO., WHITMAN, MASS.**  
ESTABLISHED IN 1810.  
**A. FIELD & SONS, TAUNTON, MASS.**  
ESTABLISHED IN 1827.  
**AMERICAN TACK CO., FAIRHAVEN, MASS.**  
ESTABLISHED IN 1867.

**LORING & PARKS, PLYMOUTH, MASS.**  
ESTABLISHED IN 1842.  
**TAUNTON TACK CO., TAUNTON, MASS.**  
ESTABLISHED IN 1864.  
**OLD COLONY RIVET CO., PLYMOUTH, MASS.**  
ESTABLISHED IN 1866.

**MANUFACTURERS OF**

Tacks, Brads, Small Nails, Shoe Nails, Lining and Saddle Nails, Tufting Nails and Buttons, Wire Nails, Finishing Nails, Patent Brads, Hungarian Nails, Steel Shanks for Boots and Shoes, Wire Tacks, Escutcheon Pins, Eyelets, Glaziers' Points, Rivets, Burrs, Furniture Springs, Pilgrim Spring Bed, and other articles.

We have the largest and only complete and fully assorted stock in the world. Our manufacturing facilities are unequalled. The foregoing well known brands we continue to use, and either will be furnished upon request. We have long distance telephone connection with our New York store and our factories.

**MAIN OFFICE, 508 SEARS BUILDING, 199 WASHINGTON ST., BOSTON, MASS.**

**BRANCH OFFICE & WAREHOUSE, 31 WARREN ST., NEW YORK.**

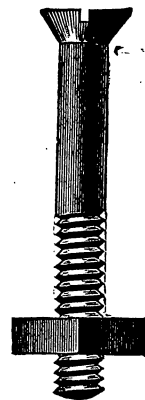
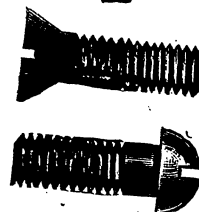
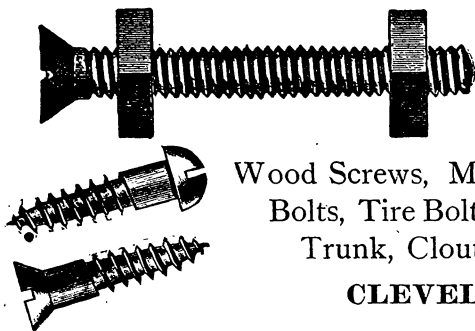
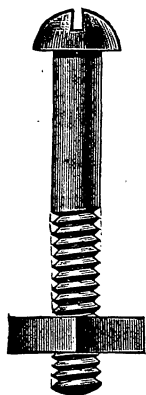
**BRANCH OFFICE & WAREHOUSE, 239 & 241 LAKE ST., CHICAGO, ILL.**

**BRANCH OFFICE & WAREHOUSE, 408 MARKET ST., SAN FRANCISCO, CAL.**

**BRANCH OFFICE & WAREHOUSE, 406 COMMERCE ST., PHILADELPHIA, PA.**

**THE NATIONAL SCREW AND TACK CO.,**

—MANUFACTURERS OF—



Wood Screws, Machine Screws, Stove  
Bolts, Tire Bolts, Sink Bolts, Tacks,  
Trunk, Clout and Small Nails.

CLEVELAND, OHIO.

Tacks, Wire Nails and Brads, Hoop Nails, Staples, Silver and Japanned Lining and Saddle Nails, Double Pointed Tacks, Slating and Roofing Nails.

**BONNIE BLUE TACKS.**

100 Kegs in a Box,  
Assorted 3 to 12 oz.  
Retail 2 Kegs for 5  
cents.

**PARISIAN GILT NAILS.**

20 papers in Car  
ton. 5 cent seller.

**MONARCH WOOD KEG CARPET TACKS.**

5 cent seller.

**"JUST ENOUGH"**

Brass Nails. 100  
Nails in a Paper, just  
enough to top a pair  
of shoes; 20 papers in  
Carton. 5 cent seller.

**DOUBLE ENOUGH**

Cobblers' Nails. 200  
Nails in a Paper, 20  
Papers in Carton. 5  
cent seller.

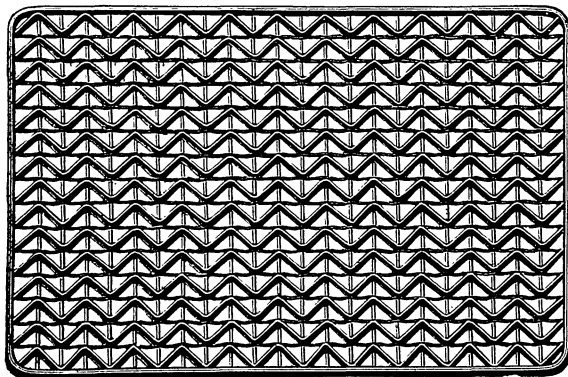
**BILL NYE BRAD BOX.**

168 Papers Wire Brads, assorted 1/2 to  
2 in. Each Paper just right to retail for  
5 cents.

QUARTER SIZE CUT OF



CHICAGO, ILL. U.S.A.

**Horrock's Metal Mat,**

Patented July 18, 1893.

MANUFACTURED BY

**JOSHUA HORROCKS,**

45 CLIFF STREET - NEW YORK CITY, N. Y.

It has more superior qualities than any mat made. Its advantages can readily be seen by its construction. It will not break or wear out, and is considered by impartial judges to be the best now on the market. It sells on sight and is galvanized after made and is reversible. Suitable for Elevated or Surface cars, and is recommended by the best medical authorities. Made in 8 sizes.

No. 1, Size 16x24. No. 2, Size 18x60. No. 3, Size 22x36. No. 4, Size, 24x48.  
" 5, " 30x48. " 6, " 36x48. " 7, " 36x60. " 8, " 36x72.

Extra Sizes Made to Order.

Send for Price-List.

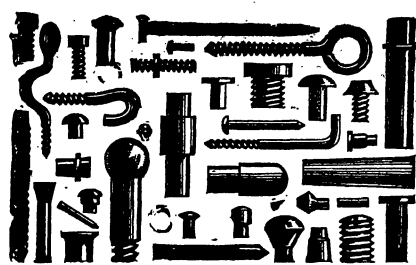
**METAL PLATE WORK. Its Patterns and Their Geometry.**

Also notes on metals and rules in mensuration for the use of tin, iron and zinc plate workers, &c.

By C. T. MILLIS. Second edition, revised and enlarged. 377 pages, 314 illustrations.

12mo, Cloth, . . . . \$3.50.

Sent, postpaid, upon receipt of price by **DAVID WILLIAMS Publisher and Bookseller, 96-102 Reade St., N. Y.**



# IRON AND BRASS RIVETS, STUDS, PINS, SCREWS, &c., *For Manufacturers of Light Hardware.* BLAKE & JOHNSON, WATERBURY, CONN.

## NEW CASTLE WIRE NAIL CO..

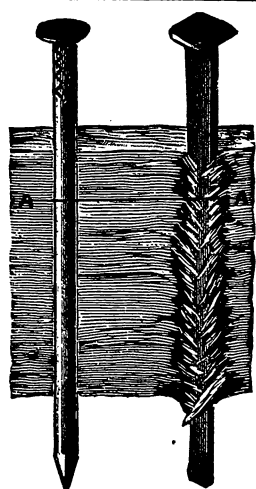
MANUFACTURERS OF



### WIRE RODS AND WIRE.

Office and Works,

NEW CASTLE, PA.



## THE SALEM WIRE NAIL CO. MANUFACTURERS WIRE NAILS.

Works: SALEM, O.; FINDLAY, O.

General Office: - SALEM, OHIO

BRANCH OFFICES:

Room 28, 277 Broadway, New York.

415 Phenix Bldg., Chicago.

200 Amer. Central Bld'g, St. Louis.

19-20 Ainsworth Block, Portland, Ore.

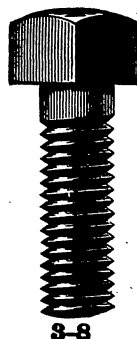
38 Pickering Bld'g, Cincinnati, O.

## REYNOLDS & CO..

MANUFACTURERS OF

SET, CAP AND MACHINE SCREWS,

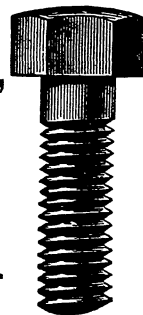
STUDS, COUPLING BOLTS, STOVE BOLTS, FINISHED NUTS, &amp;c.



3-8



6-16



3-8

Also Hand and Draw-Plate Moulding Machines for Foundry Use.

NEW HAVEN CONN.

Send for Catalogue.

## MECHANICAL DRAWING.

Progressive Exercises and Practical Hints for the Use  
of All who wish to Acquire the Art With or  
Without the Aid of an Instructor.

CONTENTS: Elementary Exercises, Straight Lines and Curves; Exercises in the Drawing of Non Circular Curves; The Principles of Projection; Objects in inclined Positions; Of the Helix and its Application in the Drawing of Screws; Intersections and Developments of Surfaces; Isometrical Drawings, Cavalier Projections, and Pseudo-Perspective; The Spur-Wheel and the Bevel-Wheel in Inclined Positions; Construction of the Close-fitting Worm and Wheel; Construction of the Screw Propeller, Standard Sectioning, etc.

By C. W. MACCORD, A.M., Sc.D. 10 x 12 inches. Cloth, \$4.00.

Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, - - - Publisher and Bookseller,

96-102 Reade Street, NEW YORK.

E. PHILLIPS & SONS  
SOUTH HANOVER, MASS.

## TACKS

F. R. EMMONS & BRO.  
21 WARREN ST., NEW YORK.FRANKLIN S. MILES,  
Manufacturer of

Brass, Iron, Steel and German Silver

SCREWS,

205 Quarry St., Philadelphia.

BORDEN &amp; LOVELL,

70 AND 71 WEST STREET.  
NEW YORK.

Steel, Iron and Wire Nails.

## OXFORD IRON AND NAIL CO., Cut Nails

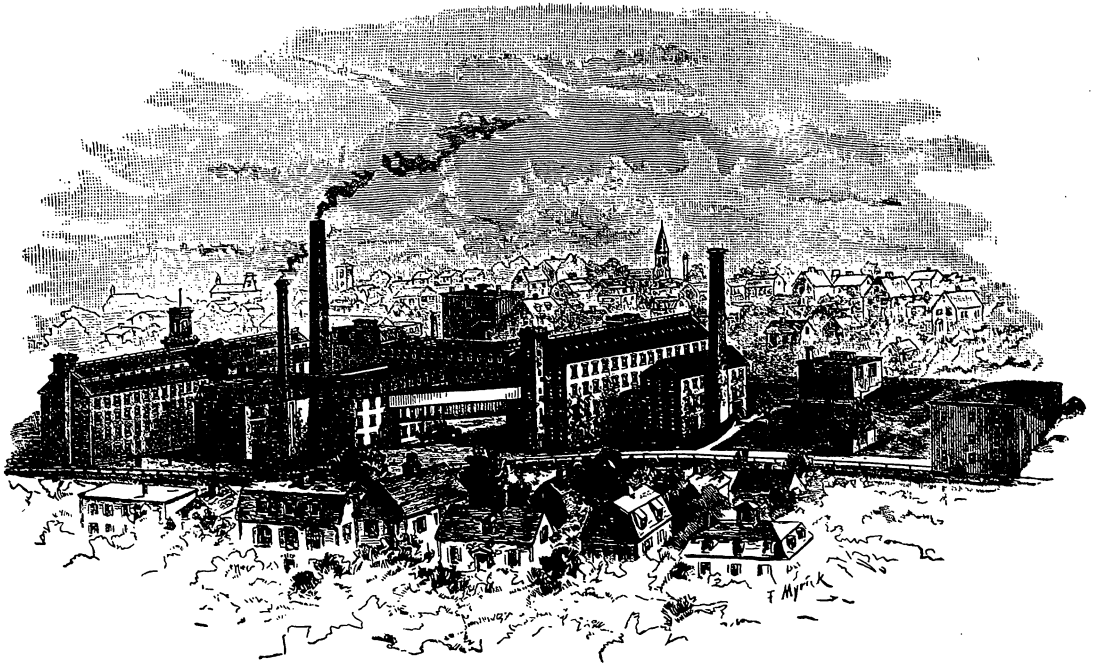
AND

SPIKES.

J. S. SCRANTON, Sales Agent.  
81, 83 and 85 Washington Street,  
NEW YORK.

# American Screw Company,

PROVIDENCE, R. I.



EAGLE MILLS, PROVIDENCE, RHODE ISLAND, U. S. A.

## MANUFACTURERS OF

### WOOD SCREWS,

In Iron, Brass, Bronze and all Varieties  
of Finish.

COACH SCREWS,  
MACHINE SCREWS,  
RAILROAD SCREWS,  
HAND RAIL SCREWS,  
SIDE KNOB SCREWS,  
LOCK CAP SCREWS,  
DOWEL SCREWS,  
CHANDELIER SCREWS,  
RIVETS, BURS,

### TIRE BOLTS,

STOVE BOLTS,  
SLEIGH SHOE BOLTS,  
SINK BOLTS,  
STOVE RODS,  
POINTED WIRES,  
TAPPED NUTS,  
WIRE NAILS,  
DOWEL PINS,  
TAPS FOR MACHINE SCREWS,  
TAPS FOR STOVE BOLTS.

**COLD  
FORGED**

Rogers Drive Screws,  
Side Knob Screws,  
Lock Cap Screws,  
Machine Screws,  
Stove Bolts,  
Forged Wood Screws,  
Threaded Wires,  
Fluted Tire Bolts.

# American Screw Company,

PROVIDENCE, R. I.


Chicago Store, No. 19 Lake St.

EUROPEAN AGENTS, THOMAS & STIRLING, Liverpool



# CONSOLIDATED STEEL AND WIRE CO.

GENERAL OFFICES, THE ROOKERY, CHICAGO, ILL.

Branch  Offices. { ST. LOUIS, MO., 1935 Papin Street.  
PITTSBURGH, PA., Westinghouse Building.  
NEW YORK CITY, N. Y., Havemeyer Building.  
SAN FRANCISCO, CAL., 81 Crocker Building.

## BARBED WIRE.

WIRE RODS and PLAIN WIRE of Every Description.

## WIRE NAILS.

Bale Ties, Fence Staples, etc.

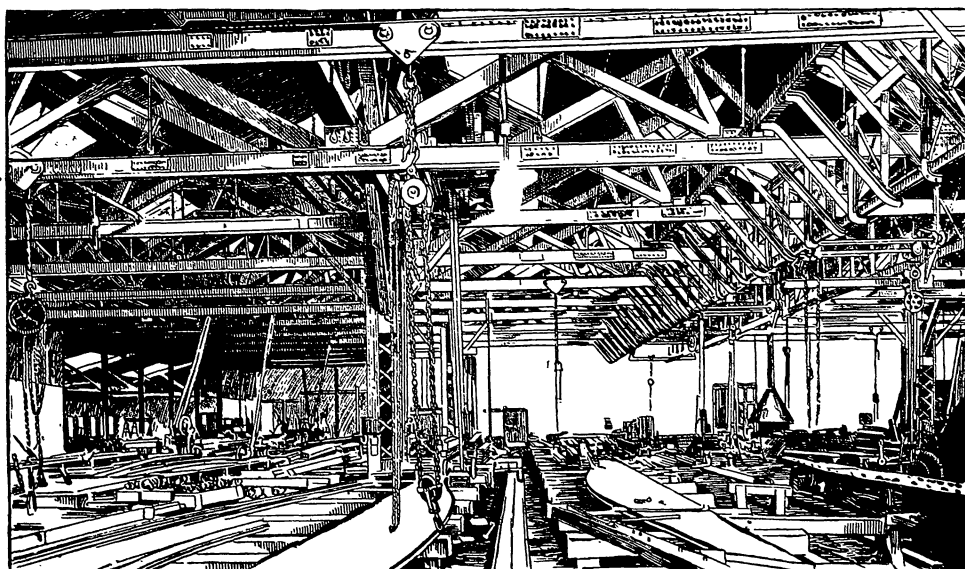
MILLS LOCATED AT

ST. LOUIS, MO. PITTSBURGH, PA. ALLENTOWN, PA.  
JOLIET, ILL. LOCKPORT, ILL.

## WROUGHT IRON BRIDGE CO. {

CANTON, OHIO.  
NEW YORK CITY.  
CHICAGO, ILL.  
KANSAS CITY, MO.

COMMUNICATE WITH NEAREST OFFICE.



Iron Buildings, Roofs and  
General Structural Work  
in Iron and Steel, Ma-  
chine Shops, Foun-  
dries, Power  
Houses, &c.

The above is a cut of our new works. The main building is 256 feet square and is fitted with improved machinery for handling all classes of Bridge and Structural work. All machinery is operated by electricity from our own plant.

## Catalogue of Books,

Including the principal works on Metallurgy,  
Mineralogy, Engineering, Electricity, Mechanics,  
&c., sent free to any address by

DAVID WILLIAMS, Publisher,

96-102 Reade Street, NEW YORK.

Established 1830.

### THE PLYMOUTH MILLS.

Rivets, Trunk Nails,  
Tacks Clout Nails,  
Burr, Wire Nails.  
PLYMOUTH, MASS.

## New and Standard Books

— ON —

**METALLURGY.****Wedding's Basic Bessemer Process.**

Translated from the German by WILLIAM B. PHILLIPS, Ph.D., and ERNST PROCHASKA, Met. E. With supplementary chapter on De-phosphorization in the Basic Open-Hearth Furnace. 222 pages; cloth; illustrated. \$3.50

**A Treatise on the Metallurgy of Iron.**

Containing outlines of the history of iron manufacture, methods of assay and analyses of iron ores, processes of manufacture of iron and steel, &c. By H. Bauerman, F. G. S., associate of the Royal School of Mines. Fifth edition, revised and enlarged. Illustrated with numerous wood engravings from drawings by J. B. JORDAN. 515 pages; cloth. \$2

**The Metallurgy of Steel.**

Volume I. By HENRY M. HOWE, A.M., S.B. mining and metallurgical engineer; illustrated with many engravings and plates. 388 pages; 11 x 14 inches. \$10

**Handbook for Charcoal Burners.**

Translated from the Swedish of G. Svedelius by PROF. R. B. ANDERSON, and edited with notes by PROF. W. J. L. NICODEMUS, C.E.; 23 wood engravings; 217 pages; cloth. \$1.50

**The Metallic Alloys.**

A practical guide for the manufacture of all kinds of alloys, amalgams and solders, used by metal workers; together with their chemical and physical properties and their application in the arts and the industries; with an appendix on the coloring of alloys. Translated and edited chiefly from the German of A. KRUPP and ANDREAS WILDBERGER, with extensive additions by WM. T. BRANNT; illustrated by 16 engravings; 428 pages; cloth. \$2.50

**The Metal Worker's Handy Book of Receipts and Processes.**

Being a collection of chemical formulas and practical manipulations for the working of all the metals and alloys, including the decoration and beautifying of the articles manufactured therefrom, as well as their preservation. Edited from various sources by WILLIAM T. BRANNT. 530 pages; cloth. \$2.50

**Electro-Plating.**

A practical hand-book on the deposition of copper, silver, nickel, gold, aluminum, brass, platinum, &c. With descriptions of the chemicals, materials, batteries and dynamo machines used in the art. Second edition; carefully revised, with additions. By J. W. URQUHART; 220 pages; cloth. \$2

**Steel and Iron.**

Comprising the practice and theory of the several methods pursued in their manufacture, and of their treatment in the rolling mills, the forge and the foundry. By WILLIAM HENRY GREENWOOD, F.C.S. With 97 diagrams; 536 pages; cloth. \$2

**Aluminum.**

Its history, occurrence, properties, metallurgy and applications, including its alloys. By JOSEPH W. RICHARDS, M.A., A.C., instructor in metallurgy at the Lehigh University. Second edition, revised and greatly enlarged. Illustrated by 23 engravings and two diagrams; 511 pages; cloth. \$5

Sent, postpaid, on receipt of price, by

DAVID WILLIAMS,

Publisher and Bookseller.

95-102 Rensselaer St., New York.

**Gautier Steel Department of Cambria Iron Co.,**

JOHNSTOWN, PA.

—: MANUFACTURERS OF:—

**MERCHANT BAR STEEL:**

Including Tire, Toe Calk, Machinery, Carriage Spring, Railroad Spring, Hoe, Rake, Fork, etc.

**AGRICULTURAL STEEL AND SHAPES:**

Finger Bars, Knife Backs, Rake Teeth, Bundle Carrier Teeth, Tedder Forks and Springs, Spring Harrow Teeth, Harrow (Drag) Teeth, Seat Springs, etc.

**PLOW STEEL:**

Flat and Finished Plow Shapes, Digger Blades, Slabs, (Penn and Pernot), Hammered Lay, Rolled Lay, etc.

**COLD ROLLED STEEL SHAFING.****STEEL HARROW DISCS.****CAMBRIA LINK BARB WIRE.**

New York Office,  
102 Chambers St.

Philadelphia Office,  
S. W. Cor. 5th & Commerce Sts.

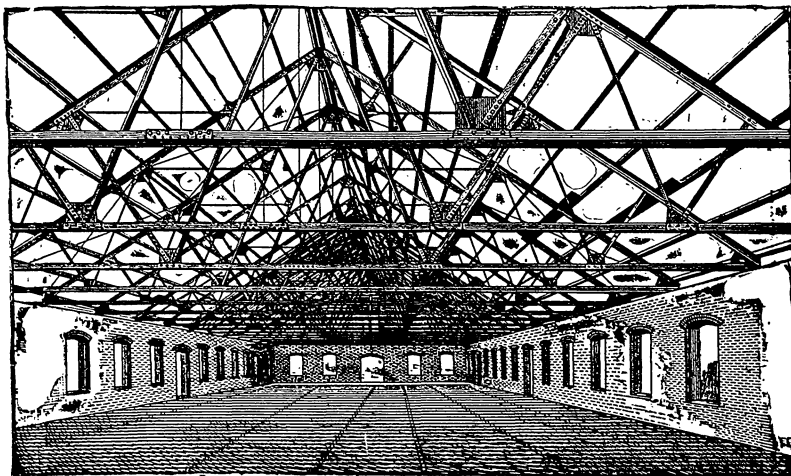
Chicago Office,  
209 Phenix Building.

Southern Office,  
Chattanooga, Tenn.

**IRON AND STEEL BRIDGES, ROOFS AND BUILDINGS**  
**BOSTON BRIDGE WORKS,**

Engineers and Builders,

MASON BUILDING, BOSTON, MASS.



Roof of Machine Shop at Portsmouth (N. H.) Navy Yard.

**INQUIRIES SOLICITED.**

D. H. ANDREWS, Prop'r.  
J. R. WORCESTER, Chief Eng'r.

A. S. MILLER, Jr., Sec'y.  
B. H. BROWN, Con. Eng'r.



IMPROVEMENTS PATENTED 1890 IN THE U. S., CANADA AND EUROPE.

**FIRE-PROOF. Easily applied by anyone. Send for Samples and Descriptive Price List.****H. W. JOHNS MANUFACTURING COMPANY,**

H. W. Johns' Asbestos Fire and Water-Proof Sheathing, Building Felt, Steam Packings, Loller Coverings, Liquid Paints, Roof Paints, Roof Cement, Fire-Proof Paints, etc.

**87 MAIDEN LANE, NEW YORK.**

JERSEY CITY, CHICAGO, PHILADELPHIA, BOSTON, LONDON.

**IRON AND STEEL ROOFING.**

Corrugated Iron, Galvanized Eave Trough and Conductor Pipe, Roofing Paints, etc.

**Cambridge Roofing Co., Cambridge, O.**

# Lukens Iron and Steel Co. INCORPORATED 1890.

The First to make Boiler Plates in America.

Chas. Huston, Pres. A. F. Huston, Vice-Prest. C. L. Huston, Genl. Mgr. Robt. B. Holmes, Jr., Secy. Jos. Humpton, Treas.

## STEEL AND IRON PLATES, ALSO SHEETS

TO EXTREME DIMENSIONS.

WIDTHS UP TO 10 FEET.

THICKNESS, No. 12 GAUGE TO 1 1/4 INCHES.

—ESTABLISHED 1810.—

WORKS:

Coatesville, Pa.

NEW YORK OFFICE:

No. 29 Broadway.

PHILADELPHIA OFFICE:

62 & 64 Bullitt Bldg.

FRANK SAMUEL,  
136-138 So. 4th St.,  
Philadelphia.

# LOW PHOSPHORUS

PIC IRON—.03 or under.  
SCRAP—.03 or .05 or under.  
ORE—For O. H. and Furnace Use.  
MELTING BAR—  
Open Hearth and Bessemer Billets,  
Skeip, Muck Bars and Scrap, Foundry  
and Bessemer Pig Iron.  
Syracuse Tube Co.'s Tubes and Pipe.

## THE PHOENIX IRON CO., 410 Walnut St., Philadelphia,

MANUFACTURE ALL THEIR PRODUCTS BOTH IN

### WROUGHT IRON AND OPEN HEARTH STEEL.

Beams, Channels, Deck Beams, Angles, Tee-bars, Zee-bars and other shapes, Round, Flat and Square BARS of all sizes, Especially adapted for Bridge and Ship Builders, Fire-proof Buildings, Shafting and all Structural Purposes.  
SPECIALTIES, in Wrought Iron or Steel:—Phoenix Columns and Upset Eye-Bars of all sizes,  
Roof Trusses, Girders, Joists and Built-up Shapes of every description.

AGENTS:—EDWARD CORNING & Co., 29 Broadway, NEW YORK; EDWARD CORNING & Co., 70 Kilby St., BOSTON, MASS; JAMES B. STOKES, 132 Market St., SAN FRANCISCO. WESTERN OFFICE: A. C. STITES, 931 The Rookery, CHICAGO.

## POTTSVILLE IRON AND STEEL CO., POTTSVILLE, PA.

PHILADELPHIA OFFICE, 226 SOUTH 4th STREET

MANUFACTURERS OF ALL KINDS OF

## STRUCTURAL IRON AND STEEL,

Viz., I Beams, Deck Beams, Channels, Tees, Angles, Plates and Bars; and also Open Hearth Steel Billets, Blooms and Slabs.

BREWERY, MALT AND ICE HOUSE CONSTRUCTION A SPECIALTY.

Designers and Constructors of Roofs, Trusses, Columns, &c.

## TESTED CHAINS.

## BRADLEE & CO., - EMPIRE CHAIN WORKS,

Beach and Otis Streets, PHILADELPHIA.

Chains for Foundry Cranes and Slings, "D. B. G." Special Crane Chain. Steel and Iron Dredging, Slope and Mining Chains. Ship's Cables and Marine Railway Chains.

A. T. WELLMAN, President.  
S. H. CHAUVENET, Vice-President.

J. H. ROOP, Treasurer.

C. H. WELLMAN, Superintendent.  
RICHARD PETERS, Jr., Secretary.

## WELLMAN IRON AND STEEL CO.

—MANUFACTURERS OF—

Highest Grade Open Hearth Low Phosphorus Steel Fire Box and Boiler Plate. Bessemer Steel Ship and Tank Plate. Open Hearth and Bessemer Blooms and Slabs.  
Low Phosphorus Pig Iron.

—PLATES UP TO 126 INCHES IN WIDTH.—

General Office and Works, Thurlow, Delaware County, Pa.

Chicago, Ills., No. 656 "The Rookery."

E. W. CRAMER, Agent.

New York, N. Y., No. 7 Nassau Street

J. H. BELCHER, Agent.

## BARCLAY W. COTTON & CO.,

Successors to ESHERICK, COTTON & CO.,

Iron and Steel Merchants.

AGENTS FOR

AMERICAN WIRE GLASS MFG. CO.

418 Walnut St., PHILA.

MIFFLIN WHEELER.

G. W. NICOLLS.

Nicolls, Wheeler & Co.,

FORMERLY

SITES, WHEELER & CO.,

216 South Third St., Philadelphia, Pa

—DEALERS IN—

IRON AND STEEL SCRAP.

Pig Iron, Muck Bars, Charcoal Blooms, &c., &c.  
Steel and Iron Plates, New and Old Rails.

# EDWARD CORNING & CO.,

MANUFACTURERS' AGENTS AND COMMISSION MERCHANTS.

BEAMS, CHANNELS,  
ANGLES, TEES,  
PLATES, BARS, RODS.

## IRON AND STEEL

HOOPS, BANDS,  
SPIKES, FISH-PLATES,  
BOLTS, NUTS, RIVETS.

29 BROADWAY,  
NEW YORK.

237 SO. THIRD ST.,  
PHILADELPHIA.

70 KILBY ST.  
BOSTON.

CORRESPONDENCE SOLICITED WITH BUYERS AND WITH MANUFACTURERS.

**EDWARD J. ETTING,**  
IRON BROKER & COMMISSION MERCHANT  
222 S. THIRD ST., PHILADELPHIA, PA.  
Pig, Bar and Railroad Iron, Old Rails, Scrap.  
AGENT FOR THE  
**MOUNT SAVAGE FIRE BRICK,**  
Eastern Penna., West New Jersey and Delaware.  
**Agent TRENTON IRON CO.,**  
For the Sale of Wire and Wire Rope.  
Longdale (Va.) and other Pig Irons.  
STORAGE YARD, Pier No. 57 South (old Navy Yard),  
which is connected with Penn. R. R. and its various  
connections. Negotiable Warehouse Receipts issued.  
CASH ADVANCES MADE ON IRON.

ESTABLISHED 1869.  
**JEROME KEELEY & CO.,**  
303 WALNUT STREET, PHILADELPHIA.  
**Foundry & Forge Pig Irons,**  
**Iron Ores, Coke, Coal,**  
**Steel Blooms, Billets, Rails, etc.**  
**Muck Bars, Blooms, Scrap Iron.**  
Consulting Engineers in Metallurgy and  
Mining.

E. H. Wilson. A. Kaiser. J. B. M. Hiron.  
**E. H. WILSON & CO.,**  
222 and 224 South Third St., Philadelphia  
BROKERS AND DEALERS IN  
**IRON AND STEEL.**  
Correspondence solicited.

**J. W. Hoffman & Co.,**  
333 and 335 Walnut St., Philadelphia,  
**COMMISSION & MERCHANTS**  
**PIG IRON,**  
Iron and Steel Plates and Shapes. Rails, Cars and  
Locomotives, and Railroad Equipment generally.  
CORRESPONDENCE SOLICITED.

**JOHN L. HOGAN & CO.,**  
IRON COMMISSION MERCHANTS,  
Bullitt Building, 135 South Fourth St., Phila.  
Agents for Brier Hill, Lehigh, Struthers  
**AND MUIRKIRK PIG IRON,**  
Delaware Rolling Mill, muck bars, Youngstown Steel  
Co., Connellsville Coke.

**NORTH BROTHERS MFG. CO.,**  
**Iron and Brass Founders,**  
*Light Castings a Specialty.*  
N. W. Cor. 23d and Race Streets,  
PHILADELPHIA.  
Correspondence solicited.

**W. H. THOMSON & CO.,**  
Dealers in  
**IRON and STEEL and**  
**other METALS**  
FOR ALL PURPOSES,  
Room 259, Bullitt Building,  
PHILADELPHIA, PA.

**LUCKNOW FORGE.**  
**JOHN W. REILY,**  
Fort Hunter P. O., Dauphin Co., Pa.,  
MANUFACTURER OF  
Blooms and Billets for Boiler Plate, Tubes,  
Sheet Iron and Wire, made from  
Pig Iron and Scrap.  
Prices Quoted—Correspondence Solicited.

B. Houston. J. Max Bernard. H. H. Houston.  
**C. B. HOUSTON & CO.,**  
Bullitt Building. PHILADELPHIA.  
Pig Iron, Coal, Coke, Steel Rails, Structural  
Iron, Steel Castings and Fire Brick.  
Sole Agents for PAXTON ROLLING MILLS.  
**STEEL AND IRON PLATES**

W. S. PILLING.

T. L. CRANE

**PILLING—AND—CRANE.**  
**IRON ORES:** Lake Superior, Foreign, Concentrates,  
Magnetic and native Self-fluxing.  
**PIG IRON:** Low Phosphorus, Open-hearth, Bessemer  
and other grades.  
**STEEL:** In Blooms, Slabs and Billets, and scrap.  
**COKE:** For Furnace and Foundry use.  
BULLITT BUILDING, 141 S. FOURTH ST. PHILADELPHIA.

**E. R. MANN & CO.,**  
Sole Agents.  
**ACME PIG IRON.**  
Guaranteed .08 % or lower in Phosphorus.

Blooms, Slabs, Plates, Sheets, Skelp, Muck-Bar and Scrap. Foreign and  
American Ore. Riverside Steel Pipe. Syracuse Boiler Tubes.  
**147 SOUTH 4th STREET, - - PHILADELPHIA.**

**ALAN WOOD COMPANY,**  
MANUFACTURERS OF  
Patent Planished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom,  
**PLATE & SHEET IRON.**  
ALSO LIGHT PLATES AND SHEETS OF STEEL,  
No. 519 Arch Street, Philadelphia, Pa.  
Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack,  
Tank and Boat Iron; Last, Stamping, Ferrule Locomotive Headlight and Jacket Iron.

**CUMBERLAND NAIL AND IRON CO.,**  
MANUFACTURERS OF  
"Cumberland" Nails & Wrought Iron Pipe,  
43 North Water St., and 44 North Delaware Ave., PHILADELPHIA.

**J. J. MOHR,**  
Bullitt Building, No. 131 South Fourth St., Philadelphia, Pa.  
—SOLE AGENT FOR—  
Sheridan, Temple, Brooke, Leesport, Mill Creek, Keystone, Mt. Laurel, Logan and Oley FOUN-  
DRY, FORGE, CHARCOAL AND BESSEMER PIG IRON.  
Dealer in Scrap, Old Car Wheels, Muck Bars and Connellsville Coke.

**High Grade Tested Chains.**  
**JAMES MCKAY & CO.,**  
29TH & LIBERTY STREETS, PITTSBURGH, PA  
Manufacturers of Coil, Crane and Stud Chain. We also manufacture High Grade  
Steel Chain made of Basic Steel and Special Crane Chain made of U. S. Iron.

**JAMES G. LINDSAY & CO.,**  
BULLITT BUILDING, 133 South Fourth St., PHILA.  
**IRON and STEEL STRUCTURAL MATERIAL**  
For all purposes. Estimates Furnished for Iron and Steel Structures.

 **DROP FORGED**  
**MERRILL BROS., 465 to 471 Kent Ave., Brooklyn, E.D., N. Y**

**FITZSIMONS & CO.,**  
—MANUFACTURERS—  
**COLD DRAWN SHAFITING IRON STEEL**  
CLEVELAND, OHIO.

**FRANCIS HOBSON, SEAMAN & CO.,**

Successors to FRANCIS HOBSON & SON,  
DON STEEL WORKS, SHEFFIELD.

Sole Manufacturers of

HOBSON'S "CHOICE" **(XX)** Extra. Best and "Warranted Best"  
Cast Steels for Tools, etc.

HOBSON'S "CHOICE" Extra Quality Needle Wire.

SEAMAN'S "**NELSON**" Brand Extra Cast Steel for Turning Hardest Chilled Rolls, &c.  
WAREHOUSE, 97 John St., New York. CHAS. HUGILL, Agent.

**THOS. FIRTH & SONS, LIMITED, SHEFFIELD.**  
**CRUCIBLE CAST STEEL.**

ABBOTT, WHEELOCK & CO.. Agents and Importers of  
**SWEDISH IRON,**

85 OLIVER ST., BOSTON.

23 CLIFF ST., NEW YORK.

**S. & C. WARDLOW, SHEFFIELD, ENGLAND.**  
Manufacturers of the Celebrated Cast and Double Shear Steel.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Razors, Carvers, Butchers' Knives, Files, Band Saws, Clock, Watch  
and all other Springs; also Sole Makers of the Special Brand **"TOUGH"** Cast Steel for Leather Splitting and  
Machine Knives of every description, and for Turning and all other Tools, Dies and Punches.

Office and Warehouse, 95 John St. New York.

Frank S. Pilditch, Agent.

**GUSTAF LUNDBERG**

Agent for **N. M. HOGLUND'S SONS & CO.** of Stockholm.  
**Swedish and Norway Iron.**

Bessemer and Open Hearth Steel.

19 KILBY STREET, BOSTON.

**CARLISLE WORKS, KAYSER, ELLISON & CO., SHEFFIELD, ENGLAND**  
Late WILSON HAWKSWORTH, ELLISON & CO.,

(ESTABLISHED 1825.)

**CRUCIBLE STEEL AND STEEL WIRE.****WETHERELL BROS., Agents.**

31 OLIVER STREET, BOSTON.

93 LIBERTY STREET, NEW YORK.

**JONAS & COLVER CONTINENTAL STEEL WORKS, SHEFFIELD, ENGLAND,**

MANUFACTURERS OF ALL KINDS OF STEEL.

Tool Steel, Drill Rods, Needle Wire, Hot Rolled Sheet Steel, Cold Rolled Steel for Cor-  
set Springs, Band Saws, Clock and Watch Springs and Parts, and all other Purposes.

**HERMANN BOKER & CO., 101 & 103 Duane Street,**

(Formerly CARL F. BOKER),

Sole Agents and Importers of Steel and Crucible Wire Rods, &amp;c.

**JESSOP'S STEEL**

MANUFACTURED BY

**WM. JESSOP & SONS, L'D.**

**OF Best Quality,**  
**IN Bars, Sheets & Plates,**

Large assortment of sizes in stock at

91 John St.

And other Agencies.

NEW YORK

**SHEFFIELD, ENGLAND.**Gold Medal Paris.  
1889.**WIRE**

DRAWING

**WORTLES, PLATES and JEWEL DIES.****DIES****NEWTON & SHIPMAN,**

83 John St., - New York.

# CAMBRIA STEEL,

Steel Rails, STANDARD AND LIGHT WEIGHTS, Street Rails and Railway Fastenings,  
 BESSEMER AND OPEN-HEARTH BLOOMS, BILLETS AND BARS.  
 Steel Axles, Steel Angles, Steel Channels, Steel Forgings  
**CAMBRIA IRON COMPANY,** Office, 218 S. Fourth St., Philadelphia.  
 Chicago Office, Phoenix Building.  
 (WORKS AT JOHNSTOWN, PA.)

**A. & P. ROBERTS & COMPANY,**  
 Pencoyd Iron Works, | Pencoyd Bridge & Construction Co.,  
 MANUFACTURERS OF | DESIGNERS AND MANUFACTURERS OF  
 Wrought Iron and Open Hearth Steel, | Bridges, Viaducts, Turn Tables, Etc.  
 OFFICE: 261 S. 4th Street, PHILADELPHIA, Pa. | WORKS, PENCYD, PA.

## EICKEN & CO.'S CRUCIBLE TOOL STEEL

HAGEN, WESTPHALIA, GERMANY.

SPECIAL No. 8 works and Fine-Finishes the HARDEST Rolls and Material. BOSS Cold Chisel; HIGH-GRADE ADAPTED Twist-Drill, Tap, Punch, Die, Reamer, Wood and Milling-Cutter-Steel and Blanks.

HIGHEST QUALITY, LOW PRICES, INDUCEMENTS to the TRADE and large USERS.

REPRESENTED BY } IMPORTERS AND EXPORTERS. { MARKT & CO., Agts.,  
 EDW'D VORSTER. } 79-85 North Moore St., New York.

Stock for immediate wants and Trial Orders. Exclusive Local Agencies granted.

## THE IRON-FOUNDER:

A COMPREHENSIVE TREATISE ON  
 THE ART OF MOLDING,

INCLUDING CHAPTERS ON

CORE-MAKING; LOAM, DRY-SAND, AND GREEN  
 SAND MOLDING; ALSO CRYSTALLIZATION,  
 SHRINKAGE, AND CONTRACTION OF CAST  
 IRON, AND A FULL EXPLANATION OF  
 THE SCIENCE OF PRESSURES IN  
 MOLDS; ADDED TO WHICH ARE  
 FORMULAS FOR MIXTURES OF  
 IRON, TABLES, RULES AND  
 MISCELLANEOUS INFOR-  
 MATION.

BY

SIMPSON BOLLAND,

Practical Molder and Manager of Foundries

Illustrated with over Three Hundred  
 Engravings.

12mo, Cloth, \$2.50.

Will be sent free on receipt of the price.

"Among the many recent additions to technical literature, we know of none of more practical value than THE IRON FOUNDER. There are thousands of men in our foundries who will be greatly benefited by its 382 pages of interesting and valuable information."—*The Age of Steel*.

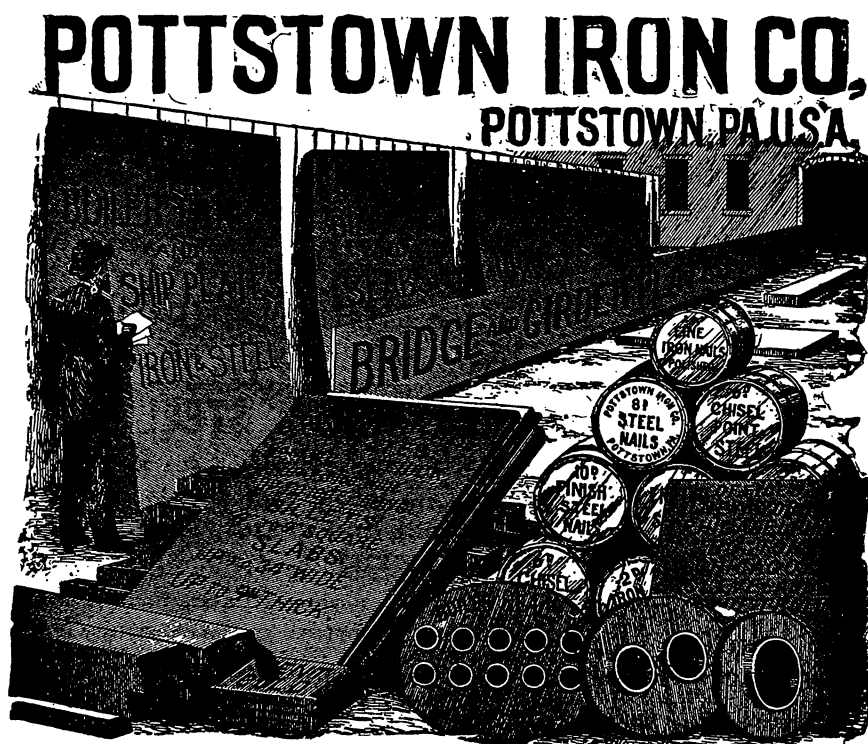
SENT, POSTPAID, ON RECEIPT OF PRICE, BY

DAVID WILLIAMS,

Publisher and Bookseller,

96-102 Reade St., New York

**A. MILNE & CO.,**  
**Swedish (Norway) Iron and Steel,**  
 BLOOMS, BILLETS, BARS; WIRE, RIVET AND NAIL RODS.  
 FOREIGN AND DOMESTIC IRON AND STEEL.  
 1 Broadway, New York. 8 Oliver Street, Boston.



**FRANKFORD STEEL COMPANY.**  
 FRANKFORD, PHILA., PA.  
**Steel Railroad and Machine Forgings,**  
 SOLID CRUCIBLE STEEL CASTINGS  
 AND  
 Best Grades of Tool and Machinery Steel.



**ÆTNA-STANDARD IRON AND STEEL CO.,**Successors to **Ætna Iron and Steel Co., and The Standard Iron Co.,** Manufacturers of**PLATES and SHEETS, BLACK, GALVANIZED and CORRUGATED** Plain Roofing, Siding and Ceiling, also of Sheet Steel, for special purposes, Cold Rolled or Plain and Patent Leveled.**BARS, LIGHT SECTION RAILS, ANGLES, TEES and CHANNELS,** odd sections and sizes, Machine Straightened Steel Tire, Ordinary Shafting, Horse-Shoe Bars, Ax-Poll Steel, Toe Calk, Nut, Bolt and Chain Rods, and other special Bars suited to every requirement.**PROMPT SHIPMENT from STOCK.**Inquiries solicited. Stock List Mailed on Application. Address, **BRIDGEPORT, OHIO.****ILLINOIS STEEL COMPANY**

General Offices, TENTH FLOOR, "ROOKERY," CHICAGO, ILL.,

— MANUFACTURE —

**Bessemer, Foundry and Mill Pig Iron, Spiegel and Ferro-Manganese,**

Iron and Steel Merchant Bar, Rail Fastenings, Light "T" and Street Rails,

Steel Billets, Wire Rods, Iron or Steel Car Truck Channels,

Steel "I" Beams and Structural Shapes, and

**BESSEMER STEEL RAILS.**

Julian L. Yale,

Gen'l Sales Agent.

A. M. Crane,

Assistant Gen'l Sales Agent.

New York Office, 46 Wall St., New York City. Milwaukee Office, 151 N. W. Ins. Bldg., Milwaukee, Wis.  
D. E. GARRISON & CO., Agents, Laclede Building, St. Louis, Mo.M. S. PICKANDS, } CHICAGO.  
W. L. BROWN, }**PICKANDS, BROWN & CO.,**PICKANDS, MATHER & Co.,  
CLEVELAND.

Sole Agents Pig Iron Department Illinois Steel Company and Manufacturers and Dealers in

**PIG IRON and IRON ORR,**

1007, 1009 and 1011 Rookery Building, Chicago.

**CARBON STEEL COMPANY,****PITTSBURGH, PA.,**

— MANUFACTURERS OF —

Universal Mill Plates. Sheared Plates and Sheets. Boiler, Ship and Armor Plates. Also  
Nickel Steel Plates. List of Sizes Sent upon Application.**AGENCIES:**

L. S. BOOMER, 647 The Rookery, Chicago, Ill.

GEO. KINSEY &amp; CO., 249 West Fourth Street, Cincinnati, O.

THE CONDIT-FULLER CO., Perry-Payne Building, Cleveland, O.

JAS. G. LINDSAY &amp; CO., Bullitt Building, Philadelphia, Pa.

BULLARD &amp; POST, 125 Milk St., Boston, Mass.

**CRESCENT STEEL**

**CRESCENT STEEL CO.**

480 PEARL ST. NEW YORK      PITTSBURGH, PA.      64 & 66 S. CLINTON ST. CHICAGO.

GEORGE MESTA, Prest.

W. D. ROWAN, Sec.

J. O. HORNING, Treas.

**LEECHBURG FOUNDRY & MACHINE CO.,**

Office: LEWIS BLOCK, Pittsburgh, Pa.

Sheet and Bar Mills, Shears, Squeezers and Roll-Lathes

**ROLLS. MESTA'S PATENT PICKLING MACHINES AND TIN PLATE MACHINERY.**

ESTIMATES GIVEN ON COMPLETE TIN PLATE PLANTS.

**— AMERICAN —****PIG IRON Storage Warrant Co.**

(Bank of America Building.)

44 Wall Street, - NEW YORK.

Correspondence of Furnaces Invited.

**PIERSON & CO.,**

— DEALERS IN —

**IRON and STEEL**

OF EVERY DESCRIPTION,

29 Broadway, cor. Morris St.,  
NEW YORK.

Tips to Inventors. By ROBERT GRIMSHAW, Ph.D.,  
M.E. Telling what inventions are needed and how  
to perfect and develop new ideas in any line.  
Cloth.....\$1.00  
For Sale by David Williams, 96-102 Reade St., N.Y.

# IRON AND STEEL

BARS, ANGLES, CHANNELS, BEAMS AND STRUCTURAL SHAPES.

Bridge, Boiler, Tank & Ship Plates.

FOUNDRY and FORGE

Pig Iron, Steel Slabs, Billets and Ingots

**CHARLES K. BARNES & CO..**

224 South Fourth St., PHILADELPHIA.

**L. & R. WISTER & CO.,**

IRON COMMISSION MERCHANTS,

257 So. 4th St., Philadelphia.

Agents for the following Foundry and Forge Pig Irons: Dunbar, Kemble, Tuscarawas (Black Band), Wyebrake C. & C., Charcoal Pig Iron, Warner & Co.'s (Middletown, England), Carbonizing and Malleable Irons. Dealers in all kinds of Scrap Iron and Steel.

**HENRY LEVIS & CO.,**

**Manufacturers' Agents**

For Iron and Steel Rails, Car Wheels, Boiler and Sheet Iron and General Railway Equipments.

Old Rails, Axles and Wheels bought and sold  
234 S. 4th St., Philadelphia.

Established 1847.

**A. WHITNEY & SONS,**

**CAR WHEEL WORKS,**

PHILADELPHIA.

Special Wheels for Furnace and Mine Cars.

**Manhattan Rolling Mill.**

**JOHN LEONARD,**

446 to 452 West St., New York.

MANUFACTURER OF

**HORSE SHOE AND BAR IRON**

**BLACKSMITH SUPPLIES.**

Brooklyn Branch, 1589 Kent Ave.

**OGDEN & WALLACE,**

85, 87, 89 & 91 Elm St., New York.

**IRON AND STEEL**

Of every description kept in stock.

Agents for Park, Brother & Co.'s

**BLACK DIAMOND STEEL.**

All sizes of Cast and Machinery Steel constantly on hand.

**WILLIAM H. WALLACE & CO.,**

**IRON AND STEEL,**

10, 12 and 14 ALBANY ST.,  
and 131 WASHINGTON ST.,  
NEW YORK.

Wm. H. Wallace. Wm. Bispham. E. C. Wallace.

**THE MAHONING VALLEY IRON CO.**

—MANUFACTURERS OF—

Bar, Band, Sheet, Plate and Tank Iron,  
Angle Iron, Nails, Boat Spikes and Rivets

**YOUNGSTOWN, OHIO.**

# THE BETHLEHEM IRON COMPANY.

SOUTH BETHLEHEM, PENNA.

**STEEL RAILS,**

**BILLETS AND MUCK BAR,**

**STEEL FORGINGS.**

HOLLOW SHAFTING, CRANKS, ROLLS, GUNS AND ARMOR.

Rough, Machined or Finished, Fluid Compressed, Hydraulic Forged.

NEW YORK OFFICE, - - - 80 BROADWAY.  
PHILADELPHIA OFFICE, - - - 421 CHESTNUT ST.

PASSAIC ROLLING MILL CO., Paterson, N. J.

—MANUFACTURE—

**ROLLED STEEL or IRON BEAMS**

Channels, Angles, Tees, Bars, Riveted Work, Forgings, Eye Bars, &c., &c.,

Also OPEN HEARTH STEEL BILLETS and SLABS.

NEW YORK OFFICE, - Rooms 151 and 152, No. 45 Broadway.

## JUSTICE COX, Jr., IRON AND STEEL

No. 218 SOUTH 4th ST., PHILA'D, PA.

Agent Haldeman, Grubb & Co.'s Chickles Bessemer Pig Iron,  
for Mahoning Rolling Mill Co.'s Best Quality Skelp Iron and Steel,  
for Pulaski Iron Co.'s High Grade Foundry and Forge Pig Iron.

Bars, Angles, Sheets, Tank and Bridge Plates, Muck Bars, Blooms, Scrap Iron and Tool Steel.

## THE MONTGOMERY IRON & STEEL COMPANY,

DANVILLE, PA.



**PIG IRON, T AND STREET RAILS,**

Light Rails, 12 to 40 lbs. per yard.

**RAIL JOINTS, SPIKES AND BAR IRON.**

## NAYLOR & CO.,

New York: 45 Wall Street.

PITTSBURGH, PA.: Lewis Block. PHILADELPHIA, PA.: Bullitt Bldg

**IRON ORE, PIG IRON,  
SPIEGEL AND FERRO,**

**IRON AND STEEL WIRE RODS, STEEL BLOOMS, BILLETS AND  
SLABS, METALS AND OLD MATERIALS.**

## R. MUSHET'S "SPECIAL," STEEL "TITANIC,"

FOR LATHES AND PLANER TOOLS.

(The "Trade-Marks" of which are registered in the United States.)

MANUFACTURED ONLY BY

SAMUEL OSBORN & CO., - - - Clyde Steel & Iron Works, Sheffield, Eng.

SOLE REPRESENTATIVES IN THE UNITED STATES,

**B. M. JONES & CO., Nos. 11 and 13 Oliver St., Boston.**

No. 143 LIBERTY STREET, NEW YORK.

## BOOKS.

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing DAVID WILLIAMS, Publisher and bookseller, 96-102 Reade St. New York

ESTABLISHED IN 1848. **SINGER, NIMICK & CO., Ltd.** PITTSBURGH, PA.

—MANUFACTURERS OF ALL KINDS OF—

Hammered and Rolled **STEEL.** Warranted Equal to any Produced.



**HIGH GRADE SPECIAL** Crucible Tool Cast Steel, for all purposes requiring the very finest quality.

**SINGER'S ANNEALED EXTRA** Crucible Tool Cast Steel, for Dies, Cutters, Surgical Instruments, Forceps, and all other purposes requiring an extra fine quality.

**BEST** Crucible Tool Cast Steel, for all purposes requiring steel of Standard quality, such as Turning Tools, Taps, Dies, Drills, Punches, Shear Knives, Cold Chisels, or Edge and Machinists' Tools generally, and for Mining and Quarrying purposes.

**SAW STEEL**, for Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

**HOT ROLLED SHEET STEEL**, for Springs, Billet Web and Hand Saws, Nicker Saws, Pocket Knives, Blades and Backs, Drawing and Stamping Cold, &c., &c.

**BRIGHT COLD ROLLED SHEET and STRIP STEEL**, for Cold Drawing, Stamping and Bending; for Bells, Cups, Ferrules, Springs, Keys, Chains, Sewing Machine and Type-Writer parts, and to take the place of Sheet Brass, all of unequaled finish and accuracy of gauge.

**ROUND MACHINERY STEEL**, for Shafting, Rollers, Spindles, &c., &c.

**AGRICULTURAL STEEL.**

"Iron Centre" Cast Plow Steel.

"Soft Steel Centre" Cast Plow Steel.

"Soft Steel Back" Cast Plow Steel.

"Extra Thick Face Centre" Cast Plow Steel.

"Special" (Solid Soft Center) Plow Steel.

Crucible Cast Plow Steel.

Steel Rotary Harrow Discs.

Finished Rolling Plow Colters.

Agricultural Steel Cut to Pattern.

Also Wagon and Carriage Springs, Axles and Steel Tire.

Represented at 243 Pearl and 18 Cliff Streets, NEW YORK, by

**HOGAN & SON**, General Agents for Eastern and New England States.

GEORGE M. HOGAN, 417 Commerce St., Philadelphia; FITZ, DANA & CO., 110 North St., Boston, and

W. E. STOCKTON, 16 & 18 West Lake St., Chicago.

HUGH RUSSEL, TEMPLE BUILDING, 185 ST. JAMES ST., MONTREAL, CANADA.

**LA BELLE STEEL CO.,**

Ridge Avenue and Belmont Street, Allegheny City, Pa. Post Office Address, Pittsburgh, Pa.

MANUFACTURERS OF ALL KINDS OF **STEEL** SPRINGS, AXLES, RAKE TEETH, Etc.

**WETHERELL BROS.**, EASTERN REPRESENTATIVES, 31 Oliver St., Boston and 93 Liberty St. N.Y.

RICE, LEWIS & SON, Toronto, Ont.

**J. TATNALL LEA & CO.,**

No. 125 So. Fourth St., Philadelphia.

**BESSEMER, MILL AND FOUNDRY PIG IRON,  
MUCK BARS AND IRON ORES.**

— SOHO IRON & STEEL WORKS —

**MOORHEAD & McCLEANE CO.**  
MANUFACTURERS OF  
**PLATE IRON & STEEL.**  
**GALVANIZED SHEET IRON**  
**CHB** TRADE MARK  
PLATES SPECIAL WIDE SHEETS AND EXTRA LONG SKELP IRONS CURVED CORRUGATED & ROOFING IRONS  
OFFICES AND WORKS.  
**PITTSBURGH.**  
EASTERN WAREHOUSE. No. 81 JOHN STREET, NEW YORK.  
WESTERN WAREHOUSE. Nos. 16 & 18 W. LAKE ST. CHICAGO.

**W. Dewees Wood Co.,**



MANUFACTURERS OF PATENT

**PLANISHED SHEET IRON.**

PATENTS:

Feb. 6th, 1877.	Feb. 12th, 1884.	Jan. 6th, 1885.
Dec. 10th, 1878.	Mar. 4th, 1884.	Aug. 31st, 1886.
Jan. 10th, 1882.	April 15th, 1884.	Jan. 1st, 1889.
Jan. 1st, 1884.	June 10th, 1884.	Jan. 17th, 1893.

Guaranteed fully equal, in all respects, to the Imported Russia Iron.

—ALSO—

Wood's Smooth Finished Sheet Irons and Sheet Steel, Cleaned and Free from Dust.

GENERAL OFFICES AND WORKS:

**McKEESPORT PA.**

Branch Office: 111 Water Street, Pittsburgh, Pa.

**J. WESLEY PULLMAN**

No. 238 S. Third St., Philadelphia.

**BEST IRON ORES**

New Jersey. New York. Lake Superior.  
WARWICK PIG IRON.

Stay-Bolt,  
Rivet, D. Link,  
Axe, Hatchet,  
Carriage and  
Wagon Axle

**IRON.**

Superior Quality Refined Bar Iron,  
"VULCAN" AND "LOCKHART" BRANDS.



SMALL CHANNELS AND ANGLES,  
**H EXAGON IRON AND STEEL.**

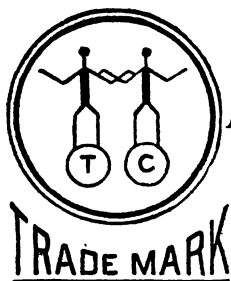
All  
Merchant Bar  
Sizes  
of  
Soft

**STEEL.**

# THE MANNESMANN TUBE CO., LTD.,

LANDORE, South Wales, England,

Manufacturers of the



## Mannesmann Patent Weldless Steel Tubes.

Rolled Direct from the Solid Bar. The only Tubes with a Spiral Fibre.

**SPECIALTIES:** Cold Drawn Steel Cycle and Boiler Tubes made of the finest Swedish Charcoal Steel produced. Far superior to any others in the market. **Best Quality Boiler Tubes** (ordinary Finish). Hydraulic, Well Boring and Shell Tubes.

**SAMPLES FREE.**

FOR PARTICULARS AND PRICES, APPLY DIRECT OR TO OUR AGENT,

**D. B. McILWAINE, 111 Chambers St., - - - NEW YORK.**

## MAHONING FOUNDRY & MACHINE SHOP,

BUILDERS OF

### Blast Furnaces, Rolling Mill and Mining Machinery,

ROTARY SQUEEZERS, ORE CRUSHERS, ROLL TRAINS, SHEARS, IRON TRUCKS, &c.

Makers of Castings of all descriptions for cable and electric railroads, building fronts, columns, etc. Address

**FRANK JAMESON, Manager, Danville, Pa.**



Hundreds of testimonials showing these castings have proved the most satisfactory and economical for all purposes requiring strength and durability.

**CHROME STEEL WORKS,**  
Brooklyn, N. Y.

## DROP-FORGINGS

—AND—

**DIES TO ORDER.**

First Class Work.

**THE HERBRAND CO., - PREMONT, O.**

**A. R. WHITNEY & CO.,**

MANUFACTURERS AND DEALERS IN

**IRON and STEEL.**

### AGENCIES:

**CARNEGIE STEEL CO., Limited,** Structural Material, Steel and Iron Columns, Beams, Channels, Shapes and Plates. Steel Beams Rolled to 24 inches deep.

**PORTAGE IRON CO., Limited,** Merchant Iron, Bars, Angles, Hoops and Cotton Ties.

**BROOKLYN WIRE NAIL CO.,** Steel Wire Nails. Export Nails a Specialty.

**RIVERSIDE IRON WORKS,** Steel Pipe.

**GLASGOW TUBE WORKS,** Boiler Flues.

**AMERICAN WIRE NAIL MACHINES.** Over 900 working satisfactorily in the United States, 25 in Europe and 100 in Canada.

**THE SEIDELL & HASTINGS CO.,** Charcoal-Iron Boiler Plates.

Plans and estimates furnished and contracts made for Iron and Steel Structures of every description. Please address,

**29 Broadway, New York.**

P. O. Box 83.

# TAYLOR

**IRON AND STEEL COMPANY.**

## STEEL FOUNDERS

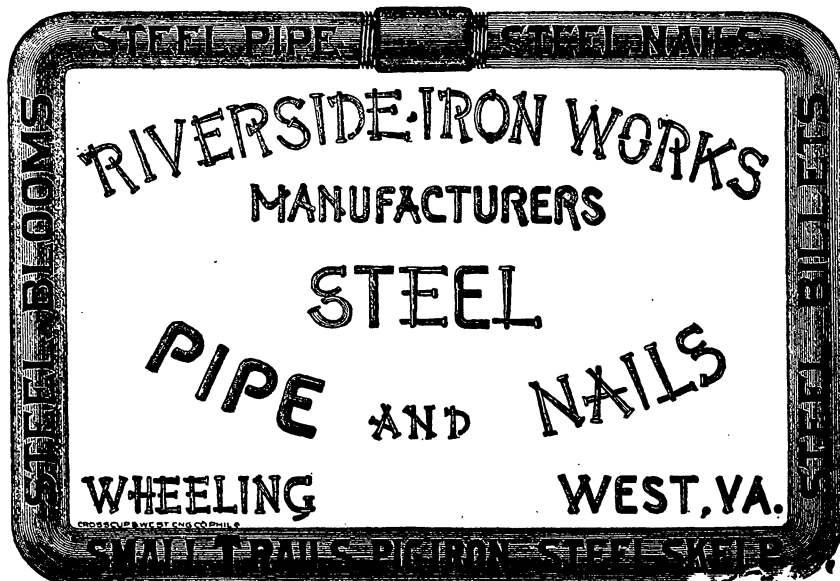
Licenses in the United States for making Hadfield's Manganese Steel.

**STEEL CASTINGS OF EVERY DESCRIPTION.**

*Specialties: Steel Tired and Solid Steel Wheels; Chilled Iron Wheels; Iron and Steel Axles, etc., etc.*

General Office and Works,

**High Bridge, New Jersey.**



**CHESS BROTHERS,**

MANUFACTURERS OF A FULL LINE OF

**SMALL CUT NAILS, TACKS, SHOE NAILS, ETC**

Always in stock. Special goods made to order.

**SOFT STEEL PLATES.**

Suitable for Implement manufacture and for all Blanking or Stamping uses of good surface, rolled carefully to gauges, ranging from No. 6 to 16, inclusive, in widths up to 15½ inches and to multiples of lengths desired. Finished black or scaled. And

**EXPANDED METAL**

In all its varieties of Fire-Proof Lath Fencing, Tree Guards, &c. Send for catalogues and prices.

Office, 531 Wood St., PITTSBURGH, PA.

**DROP FORGING**

J.C. SPEIRS &amp; CO. WORCESTER. MASS.

J.S. SEAMAN.  
ROBT. SLEETH  
GEO. P. BLACK

PHOENIX ROLLWORKS  
SEAMAN, SLEETH & BLACK  
OFFICE & WORKS  
41ST & 42ND ST & A.V.R.R.

ESTABLISHED 1870

MANUFACTURE AND FINISH  
ROLLS AND PINIONS  
EXCLUSIVELY  
FOR ALL PURPOSES.

John H. Ricketson, Prest. Wm. Holmes, Treas.  
A. G. Barnett, Sec'y.**A. CARRISON FOUNDRY Co.,**

Manufacturers of Sand, Patent Homogeneous, Steel and

**Chilled Rolls**

Ore and Clay Pulverizers, Rotary Squeezers, Haskin's Patent Double Spiral Pinions and Rolling Mill Castings of every description.

Office, Nos. 10 &amp; 12 WOOD ST., PITTSBURGH, PA.

**BIRMINGHAM IRON FOUNDRY,**

BIRMINGHAM, CONN.

**CHILLED ROLLS AND ROLLING MILL MACHINERY,**

McCoy Patent Mill Pinions, Shears, Rotary Squeezers.

**WIRE DRAWING MACHINERY**

Special Rolling Machines for Gun Barrels, Hoes, Pick and Axe Polls, Odd Shapes and Tapers.

ESTABLISHED

1836.

**POWDER**

—FOR—

Blasting, Mining and Sporting.  
ORANGE BRAND.

**ELECTRIC BLASTING APPARATUS**

SAFETY FUSE, &amp;c.

Send postal card for Illustrated Pamphlet, showing sizes grains Powder, and describing Blasting Apparatus. Mailed FREE.

**LAFLIN & RAND POWDER CO.,**

New York Office, 29 Murray St.

**DYNAMITE,**

RED STAR BRAND

For Mining, Quarrying and Stump Blasting.

Safety Fuse, Caps, Platinum Fuse, Leading and Connecting Wire, with every other requisite for Blasting Purposes. The special attention of the hardware trade is invited to our line of goods.

**NEW YORK POWDER CO.,**

62 Liberty St., New York.

**VULCAN IRON WORKS  
CHICAGO  
PILE DRIVERS****S. CHENEY & SON,  
GRAY IRON CASTINGS,**

CHEAP HEATING STOVES,  
DIAMOND THIMBLES,

MANLIUS, N. Y.

ROLLS. EST'D. AND 1863 PINIONS.

THE TOTTEN & HOGG  
IRON & STEEL  
FOUNDRY CO.  
OFFICE & WORKS  
24TH ST & A.V.R.R.  
PITTSBURGH

CHILLED & SAND ROLLS  
AND ROLLERS  
ROCK CRUSHERS.

SHEARS  
SQUEEZERS AND  
ROLLING MILL MACHINERY.

**THE CAMBRIDGE IRON & STEEL CO.**

MANUFACTURERS OF

**GALVANIZED**

BLACK SHEETS  
FOR ROOFING & CORRUGATING

CORRESPONDENCE  
SOLICITED

**SHEET IRON**

PICKLED  
& COLD ROLLED FOR STAMPING

CAPACITY RANGES FROM NO. 30  
26 INCHES WIDE TO 14x40x120

OFFICE &amp; WORKS CAMBRIDGE, OHIO.

—ESTABLISHED 1850.—

**ARCADE MALLEABLE IRON CO.**

WARREN MCFARLAND &amp; CO.

Malleable Iron and Steel Castings,  
WORCESTER, MASS.

Correspondence solicited. Prices given on receipt of patterns or samples

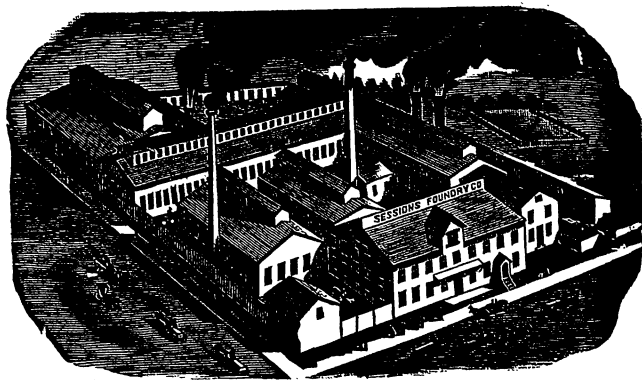
GEO. B. BUCKINGHAM.

## IRON CASTINGS TO ORDER.

Small and Large Grey (or common) Iron Castings of uncommonly fine quality. Four large Cupolas run daily. Castings soft, smooth and strong. Prices very Low.

We make Castings for all purposes, such as Builders' and Domestic Hardware, Electrical work, Piano and Organ, Wringer, Furniture, Lamp and Chandelier and Agricultural Implement Castings, Grates, Furnace and Machinery Castings, &c., &c. If you buy any, write us, stating quantities and send samples if possible.

**SESSIONS FOUNDRY CO., Bristol, Conn.**



**MCLEOD & HENRY Co**  
**FIRE BRICK**  
**TROY, N.Y.**

LIGHT SOFT GREY IRON CASTINGS AND INTRICATE CORE WORK SPECIALTIES.

Estimates cheerfully given on all kinds of Castings.

**PEERLESS FOUNDRY CO.,**

Washington Ave., above 20th St.,  
 ROBERT PRESTON, Manager. PHILADELPHIA

ESTABLISHED 1856.

**HENRY MAURER & SON,**

MANUFACTURERS OF

**FIRE BRICK**

of all Shapes and Sizes,

420 E. 23d St. New York.

**B. KREISCHER & SONS,**  
**FIRE BRICK**

BEST AND CHEAPEST,

ESTABLISHED 1845,

Office, foot of Houston Street, East River, NEW YORK

ESTABLISHED 1864.

**JAMES GARDNER & SON,**

MANUFACTURERS OF

"STANDARD SAVAGE" FIRE BRICK  
 TILE and FURNACE BLOCKS

OF ALL SHAPES AND SIZES.

WORKS, Ellerslie, Allegheny Co., Md.  
 OFFICE, Cumberland, Md.; P. O. Box 540.

S. M. Hamilton & Co., Agents, - Baltimore, Md.  
 Stowe, Fuller & Co., Agents, - Cleveland, O.

Established 1848.

**OSTRANDER FIRE BRICK CO.,**

Manufacturers of

**FIRE BRICK**

FOR ALL PURPOSES  
 TROY, N. Y.

**UNION MINING COMPANY**  
**MOUNT SAVAGE FIRE BRICK.**

Agent for Eastern Penna., West New Jersey and Delaware  
 EDWARD J. ETTING,  
 Third St., Philadelphia, Pa.



Soft Castings for Electrical Work and Sewing Machines. Fine Light Gray Iron Castings. Metal Patterns designed and made. Also Japanning and Galvanising.

CLEVELAND, O.

**STEEL  
 CASTINGS**

FROM 1 to 40,000 POUNDS WEIGHT,  
 Of Open Hearth, Chester or Bessemer Steel.

True to Pattern. Sound. Solid.

Gearing of all kinds, Crank Shafts, Knuckles for Car Couplers.

Cross-Heads, Rockers, Piston-Heads, etc., for Locomotives.

Steel Castings of Every Description.

**Chester Steel Castings Co.**

Works, Chester, Pa. Office, 407 Library St., Philadelphia, Pa.

**THE ROBINSON-REA MFG. CO.,**

PITTSBURGH, PA.

**SAND AND CHILLED ROLLS.  
 TIN PLATE PLANTS COMPLETE.**

(No. 5.)



**All Use It!**

Because it's not only best, but cheapest in the end. Requires no experimenting. Anyone can successfully use it from the start. Samples free.

**THE J. D. SMITH FOUNDRY SUPPLY CO.,**  
 CINCINNATI, O.

**A Treatise on Belts and Pulleys.**

Embracing full explanations of Fundamental Principles; proper Disposition of Pulleys; Rules for determining widths of leather and vulcanized rubber belts, and belts running over covered pulleys; Strength and Proportions of Pulleys, Drums, &c. Together with the principles and necessary rules for Rope Gearing and transmission of power by means of Metallic Cables. By J. Howard Cromwell, Ph. B., author of a Treatise on Toothed Gearing. 12mo, cloth. \$1.50.

SENT, POST-PAID, ON RECEIPT OF PRICE BY

**DAVID WILLIAMS, Publisher and Bookseller,**

96-102 Reade Street,

New York City



**WYMAN & GORDON, Worcester, Mass.****GRAY IRON, BRASS, ALUMINUM and ALUMINUM BRONZE CASTINGS**  
of the very best quality.Very much time saved by using clean and soft castings. We use only the best material. A trial will convince you. **PICKETS and ROSETTES** for Wire Workers. Catalogue of same. **NICKEL PLATING and JAPANNING**, also **METAL PATTERN MAKING**. We invite correspondence.**HAIGHT & CLARK, - - ALBANY, N. Y.**

## DROP FORGINGS

Of Every Description, in Iron, Steel, Copper and Aluminum.

Hoist Hooks, Shafting Collars, Eye Bolts, Wrenches, Machine Handles, Fence Ornaments.

**SPECIAL ATTENTION GIVEN TO THE MANUFACTURE OF SPECIAL FORGINGS.****PHILADELPHIA DROP FORGE COMPANY,**  
Office and Works, S. E. Cor. American and York Sts., Philadelphia.**THE JOHNSON FOUNDRY CO..**  
JOHNSTOWN, PA.  
**CHILLED AND SAND ROLLS.**  
GENERAL CASTINGS.**STANDARD FOUNDRY & MFG. CO., - CLEVELAND, OHIO.**

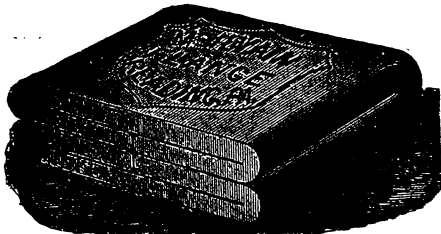
—HEADQUARTERS FOR—

**LIGHT GRAY IRON CASTINGS.**

—UNEQUALED IN—

**SOFTNESS and SUPERIOR FINISH.**

Our Castings in finishing will save time and tools. We solicit a trial order knowing that we can please you. Send samples for prices.

**TENSILE STRAIN.** } 56,000 to 64,000 lbs.**CAPACITY.** { Plates 1 inch thick to No. 12.  
30 feet long.  
70 inches wide.**WM. McILVAIN & SONS,**

READING, PA.,

MANUFACTURERS OF

**IRON AND STEEL  
BOILER PLATES.**

Locomotive, Fire Box, Flange, Shell, Tank Iron and Steel, including Plates for Bridges, Girders, Stacks, Pipe and Fire and Burglar-proof Safes.

## DROP FORGING.

ESTIMATES GIVEN ON APPLICATION.

Sole Manufacturers of Ahlstrom's Patent Parallel Double

**EXPANSION BOLTS,**

also Single Expansion Bolts. Catalogues mailed on Application.

**W. C. BOONE MFG. CO. - Office and Factory, - BOONTON, N. J.****The Trenton Malleable Iron Company.****MALLEABLE CASTINGS**

Made from Refined Air Furnace Iron.

**SPECIALTIES:** Malleable Iron Castings, Car Couplers, R. R. Supplies, Street Car R. R. Supplies, Car Replacers, Malleable Iron Castings for Contract Work, Frog and Switch Castings, Castings—Light and Heavy, Journal Box Castings, Car Trimmings.

Prices given upon receipt of Patterns or Sample Castings.

**Trenton - - - - New Jersey.****R. D. Wood & Co.** 400 Chestnut St. PHILADELPHIA.

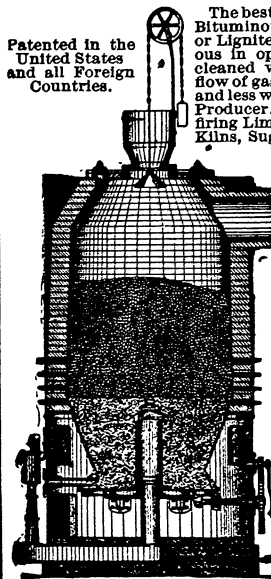
SOLE MAKERS OF THE

**TAYLOR REVOLVING-BOTTOM  
GAS PRODUCER.**

Patented in the United States and all Foreign Countries.

The best Producer for either Bituminous or Anthracite coal or Lignite; absolutely continuous in operation, as the fire is cleaned without stopping the flow of gas. Less labor required and less waste than in any other Producer. Producer Gas for firing Lime, Brick and Pottery Kilns, Sugar-house Char Kilns, Boilers, etc.

Also applicable to all Regenerative Furnaces. Send for Pamphlet.

**CAST IRON  
PIPE****MATHEWS' FIRE HYDRANTS  
EDDY VALVES,  
VALVE  
INDICATOR POSTS.**Heavy Loam Castings  
Special Machinery.Water Power Pumps  
and  
TURBINES.**HYDRAULIC JIB and TRAVELING CRANES,  
FREIGHT and CAR LIFTS, Etc.  
GAS HOLDERS and GAS MACHINERY.****WEST COXSACKIE IRON FOUNDRY.**Soft, **CASTINGS** Gray, Light Medium

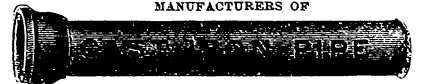
We solicit correspondence. Prices on application.

**COXSACKIE, N. Y.****A Trial will  
Convince You**

— THAT WE MAKE —

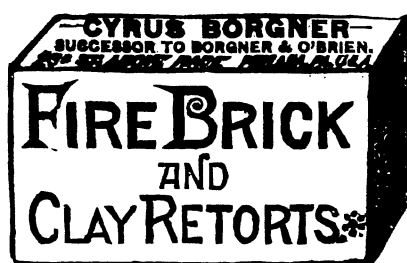
**SOFT AND SMOOTH****Light Gray Iron Castings,**

- - SOUND - -

**Brass and Bronze Castings****TRUE TO THE PATTERN.**Also HAVE FACILITIES FOR FINISHING.  
Sample for estimate solicited.**I. S. SPENCER'S SONS, Guilford, Conn.****DONALDSON IRON COMPANY,**  
MANUFACTURERS OF**CAST IRON PIPE**  
And Special Castings for Water and Gas. Also Flange Pipe  
Emaus, Lehigh Co., Pa.**FRANCIS WISTER,  
COMMISSION MERCHANT,  
COKE, COAL, ORES.**National Foundry Coke a Specialty.  
Sulphur less than 0.5.All sizes National Crushed Coke.  
Bullitt Building, PHILADELPHIA.**FINE GRAY IRON****FRANKLIN IRON FOUNDRY,  
The Burr and Houston Company**

33-39 Franklin Street, Brooklyn (Greenpoint), N. Y.

Special Attention Given to Fine Castings.  
Telephone Call Greenpoint 174.



**Frank C. Roberts & Co.,**  
CIVIL ENGINEERS.

Blast Furnaces, Steel Works, Rolling Mills, Iron and Steel Bridges and Buildings, Factory and Warehouse Construction

OFFICES:

S. E. Cor. 4th and Chestnut Sts., Philadelphia, Pa

## Books for Assayers

### The Assayer's Manual.

An abridged treatise on the docimastic examination of ores and furnace and other artificial products. By BRUNO KERL; from the German by W. T. BRANNT; second American edition, edited, with additions, by F. LYNWOOD GARRISON; 354 pages, illustrated cloth.....\$3

### Notes on the Chemistry of Iron.

For professional men, students, iron and steel merchants and all interested in iron. Explaining the methods of analysis, and how to apply the results obtained. Third edition, revised and enlarged. By MAGNUS TROLLIUS; 143 pages; cloth.....\$2

### System of Quantitative Chemical Analysis.

Edited by PROF. O. D. ALLEN, assisted by PROF. S. W. JOHNSON. Revised and corrected by DR. C. R. FRESSENIUS; 883 pages; cloth.....\$6

### Manual of Qualitative Chemical Analysis.

Translated into the new system and newly revised by Samuel W. Johnson, M. A. Ninth edition. By DR. C. R. FRESSENIUS. 500 pages; cloth.....\$4

### Quantitative Chemical Analysis by Electrolysis According to Original Methods.

Authorized translation from the German of Dr. Alex. Classen. By PROF. WM. HALE HERRICK. Teaching electrolytic methods, useful in laboratories for research, and in technical laboratories, especially those connected with metallurgical works. Cloth \$2.50

### The Blowpipe in Chemistry, Mineralogy, and Geology.

Containing all known methods of anhydrous analysis, many working examples, and instructions for making apparatus. By LIEUT. COLONEL W. A. ROSS, R.A., F.G.S. With 120 illustrations; 214 pages; cloth.....\$2

### The Art of Electrolytic Separation of Metals.

Theoretical and Practical. By G. GORE. Fully illustrated; 8vo, cloth.....\$3.50

### A Text Book of Assaying;

for the use of students, mine managers, assayers, &c. By J. J. and S. C. BERINGER; 400 page diagrams; cloth.....\$3.25

### Exercises in Quantitative Chemical Analysis.

With a short treatise on gas analysis. By W. DITTMAR.....\$4.25

Any book published sent, postpaid, on receipt of price, by

**DAVID WILLIAMS,**

*Publisher and Bookseller,*

96-102 Reade Street, New York.

# THE GALLOWAY BOILER.

Safety, Maximum Economy in Fuel, Lowest Cost of Maintenance.  
Greatest Durability, Large Steam and Water Spaces.

*Are the Advantages Offered by this Boiler.*

SPECIFICATIONS AND PRICES UPON APPLICATION TO

**EDGE MOOR IRON COMPANY,**  
Post Office, Wilmington, Delaware.

WILLIAM SELLERS, Pres't.

JOHN SELLERS, Jr., Vice-Pres't.

H. B. BRADFORD, Supt.

WM. F. SELLERS, Secretary.

WILLIAM H. CONNELL, Treasurer.

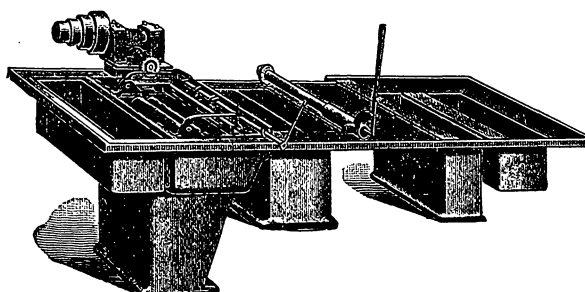
F. W. HEISLER, Purchasing Agent.



ESTABLISHED 1876.  
**THE SARGENT COMPANY**  
FORMERLY *The Congdon Brake Shoe Co.*  
**IRON & STEEL FOUNDERS**  
59TH & WALLACE STS. CHICAGO.  
**BRAKE SHOES-STEEL CASTINGS.**

**THE LLOYD BOOTH CO.,** YOUNGSTOWN, OHIO.

Tinning  
MACHINERY.



Rolling Mills,  
Sand and Chilli  
ROLLS.

**THE GARTLAND FOUNDRY CO.,**

MANUFACTURERS OF

Light Work our Specialty. **Soft Grey Iron Castings.** We are prepared to do Japanning and Galvanizing.

UNION and ECHO STS.,  
Cleveland, Canton & Southern R. R.,

CLEVELAND, O.

**Haines Gauge Co.,**

906 Filbert St.,

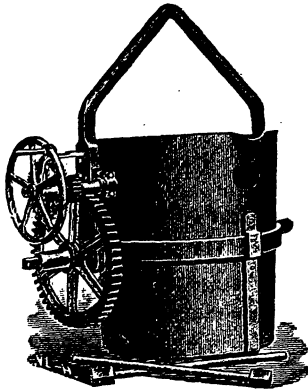
**PHILADELPHIA,**  
PA., U. S. A.



**The HAINES Automatic Micrometer Rolling Mill GAUGE.**

For reducing HOT WORK in process of rolling

# Ladles



of every design and capacity. Twenty pounds to twenty tons. Standard and special. We make a business of it, and make a better article than you can, and at less cost. See circular.

## Detroit Foundry Equipment Co.,

DETROIT, MICH. AVE. and D. and B. C. RY.

CHICAGO, 225 DEARBORN ST.

CRANES,  
CUPOLAS,  
TUMBLERS,  
TRUCKS.

Whiting's  
Improved  
Car Wheel Foundry  
Plant.

# THE S. Obermayer Co.,

FOUNDRI FACINGS, PLUMBAGO and  
Manufacturers of FOUNDRY SUPPLIES, Importers of INDIA SILVER LEAD  
FOUNDRI EQUIPMENTS. FOR ALL PURPOSES.  
Selling Agents for BLAKENEY CUPOLA.

CINCINNATI, OHIO.

Send for Catalogue.

**Foundry  
facings**

**Foundry  
Supplies**

MANUFACTURERS,  
**J. W. PAXSON & CO.**  
Philadelphia, Pa.

GROUND SILICA ROCK,  
FIRE BRICK,  
FOUNDRY LADLES,  
TUMBLING BARRELS.  
CORE-COMPOUND.

THE WILLIAMS PRINTING CO.,

Commercial Printers <sup>AND</sup> Binders

ESTIMATES FURNISHED FOR ALL CLASSES OF WORK.

96 98, 100 & 102 READE ST.,

NEW YORK

## Shear Grinding Machinery.

**TRETHERWEY MFG. CO., - 47th ST., PITTSBURGH, PA.**

MANUFACTURERS OF

Circle Cutting Machines, Roll Lathes, Hardened Forged Steel Rolls, Roll Turning Tools, Solid Steel Shear Knives, Tool Steel Dies of any size. Forgings of Machinery or Tool Steel, Rolling Mill Machinery, Steam Hammers, Squaring Shears, Double Headed Rotary Shears.

**McCLURE, AMSLER & CO.,**  
**Engineers and Contractors,**  
*Bissel Block, Pittsburgh, Pa.*

**BLAST FURNACE CONSTRUCTION**  
**A SPECIALTY.**

General Agents for Massick's and Crooke's Patent Fire Brick Stoves; Designs and Estimates for the construction of Blast Furnace Work, and for all kinds of Hot Blast Fire Brick or Pipe Stoves; and all other kinds of Brick Work pertaining to Steel Plants, Iron, Brick or Wooden Buildings, all kinds of Iron Construction in general.

*We propose to put into successful operation all the plants we design and contract for.*

## The Iron-Masters' LABORATORY

Exclusively for the  
*Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.*

Branch Office, 339 Walnut St., Philadelphia.  
All Analytical Work at Warrenton, Virginia.  
**J. BLODGET BRITTON.**

This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes, the object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

M. V. SMITH, PRES.  
C. C. MORROW, SEC.

M. A. GREENE, VICE-PRES.  
JOHN A. ELLIOTT, TREAS.

**Artificial Gas  
Engineering Co.,**  
Consulting and Contracting  
**ENGINEERS.**

ARTIFICIAL Gas applied to all Branches of Manufacturing and Domestic Uses. Apparatus for the Manufacture of Coal-Gas Furnished at Lowest Prices.

**706 TIMES BUILDING,**  
**PITTSBURGH, PA.**

**THE S. R. SMYTHE COMPANY, INCORPORATED.**

LEWIS BLOCK, ENGINEERS AND CONTRACTORS. PITTSBURGH, PA.

**Regenerative Gas Furnaces and Gas Producers  
For All Purposes.**

TUBE, STEEL, ROLLING MILLS, GLASS WORKS CONSTRUCTION, Etc,

We contract for complete Plants, guarantee results and satisfactory operation of same.

**OVER 100 PLANTS IN SUCCESSFUL OPERATION.**

**JULIAN KENNEDY.**  
**Consulting and Contracting Engineer,**

Rooms 36, 37, 38, 39 Vandergrift Building, Pittsburgh, Pa.

Blast Furnaces, Bessemer and Open Hearth Steel Works, Rolling Mills.

**STEAM AND HYDRAULIC MACHINERY, &c.**

—Branch Office of The Latrobe Steel Works.—

**Wm. Swindell & Bros.,**  
ENGINEERS AND CONTRACTORS,

Regenerative and Recuperative Gas Furnaces for  
Steel, Iron and Glass.

**SWINDELL'S IMPROVED GAS PRODUCERS,**

243 BUILT SINCE APRIL 1, 1891.

P. O. Box 945.

548 Smithfield St., Pittsburgh, Pa.

**ALEX LAUGHLIN & CO.**

LEWIS BLOCK, PITTSBURGH, PA.

GAS HEATING  
GAS PUDDLING  
CRUCIBLE  
OPEN HEARTH  
TUBE WELDING

**FURNACES**

AND ARTIFICIAL GAS PRODUCERS OF EVERY  
DESCRIPTION, FOR ROLLING MILLS, STEEL AND TUBE WORKS.  
We guarantee to place all plants erected by us in successful operation.

**J. A. HERRICK, M. E.,**  
Consulting Engineer and Contractor:  
Room 609, 284 Pearl Street, NEW YORK.  
—STEEL CASTING PLANTS A SPECIALTY.—  
Melting and Heating Furnaces of ALL KINDS.  
Patent Gas WATER VALVES. Improved "BASIC" and "SEMI-STEEL" Processes and FURNACES.  
New CONTINUOUS Gas PRODUCERS.

**JAMES P. WITHEROW CO.,**

SHOPS: New Castle, Pa.

GENERAL OFFICES: Times Building, Pittsburgh, Pa.

**ENGINEERS, CONTRACTORS, &c.**

JAMES P. WITHEROW, General Manager.

JAMES HEMPHILL, President.  
WM. H. CONLEY, Treasurer.

THOS. B. RITER, Vice-President.  
JNO. F. WILCOX, Gen'l Manager.

## PITTSBURG IRON & STEEL ENGINEERING CO.

LEWIS BLOCK, PITTSBURG, PA., U. S. A.

### BESSEMER AND OPEN-HEARTH STEEL PLANTS.

Rolling Mills (Blooming, Rail, Plate, &c). Blast Furnaces, Engines  
Boilers, Bridges, Girders, Iron Buildings.

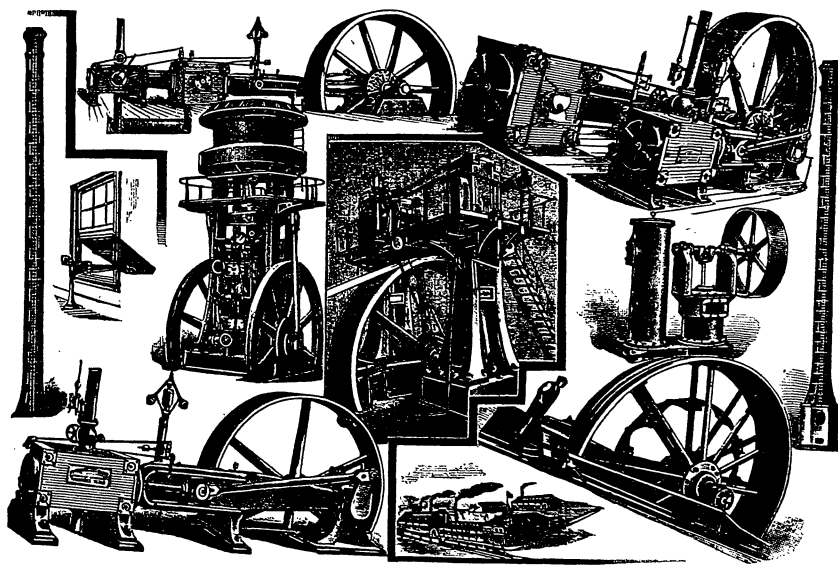
WORKS BUILT COMPLETE and Fully Equipped for Operation.

## THE D. R. LEAN COMPANY, ENGINEERS and CONTRACTORS,

Penn Building, Pittsburgh, Pa.

Blast Furnace and Steel Plant construction. Regenerative  
Gas Furnaces and Gas Producers.  
Sole Agents **FORD & MONCUR'S** Fire Brick Stove, Machinery  
and Castings, Iron Buildings, &c.

— PHILADELPHIA CORLISS ENGINES. —  
AIR PUMPS AND CONDENSERS.  
BAND AND FLY WHEELS. STEEL-PLATE CHIMNEYS.  
— BLOWING ENGINES. —



BUILT BY

**PHILADELPHIA ENGINEERING WORKS, LIMITED,**  
MIFFLIN STREET, EAST OF FRONT,  
PHILADELPHIA, PA.

## COLD DRAWN STEEL SEAMLESS TUBING



From  $\frac{3}{8}$  to  $1\frac{1}{4}$  inches in diameter and from  
No. 8 gauge to 26. Made from the best  
quality of steel, guaranteed perfect and to  
stand the severest tests. Reasonable in price.  
Address, for samples and prices,  
**SHELBY, OHIO.**

## Gray Iron Castings

Made to order. Send Samples for Estimates.  
**Shilling Foundry Co., Columbus, O.**

### THE ALLENTOWN ROLLING MILLS,

MANUFACTURERS OF

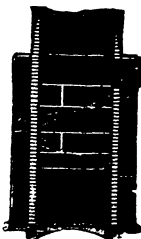
Pig Iron, Merchant Bar Iron, Rolled Shafting, Mine Rails, I-Beams, Tee Bars, Fish  
Plates, Bolts, Nuts and Spikes.

Transfer and Locomotive Turn Tables, Blast Furnace, Rolling Mill and Mining Ma-  
chinery, Mining Pumps, Etc. Roll Trains, Shears, Punches, Iron Trucks, Etc. Builders  
of all classes of Machinery. Makers of Castings of all descriptions for Cable and  
Electric Railway.  
**ALLENTOWN, PA.**

## VICTOR COLLIAU,

Sole builder of his

New and Improved Patented



**HOT-BLAST  
Colliau Cupola,**

287 Jefferson Ave.,

DETROIT, MICHIGAN.

U. S. A.

## Patent Tumbling Barrels.

MANY VARIETIES

For all Kinds of Work.

Send for new Catalogue.

**HENDERSON BROS.,** WATERBURY, CONN

## HENRY AIKEN,

Consulting Mechanical Engineer,

Rooms 203-206 Lewis Block

PITTSBURGH PA.

## EXHAUST TUMBLERS,

Hexagon, Round or Wooden  
BEST AND CHEAPEST.

## WM A. SWEETSER

39 Montello St., Brockton, Mass

## Machinery Pattern Making

CONTAINING

FULL SIZE PROFILES OF GEAR TEETH  
AND FINE ENGRAVINGS ON FULL-PAGE  
PLATES, ILLUSTRATING MANNER OF  
CONSTRUCTING NUMEROUS AND  
IMPORTANT PATTERNS AND  
CORE BOXES.

By **P. S. DINGEY,**

Practical Pattern Maker and Mechanical Draftsman.

376 Fine Illustrations; 12mo, cloth, \$2.

### CONTENTS.

The Pattern Maker and His Trade.  
The Pattern Shop—Its Position, Size and Require-  
ments.  
Marking and Recording Patterns.  
Printing-Press Cylinders.  
Differential Chain Pulleys.  
A Handy Tool for Laying out Hexagon Nuts.  
How to Cast Journal Boxes on Frames.  
How to Strike an Arc by the Aid of Three Points.  
Key-Heads for Motion Rods—The way to lessen the  
cost of their production.  
Elbow and Tee Pipes—A quick method for turn-  
ing the patterns and core boxes in the Lathe.  
Slide-Valve Cylinders.  
Corliss Cylinders—With a full description, show-  
ing how to construct patterns and core-boxes  
which can be changed at short notice for  
different stroke engines.  
Fly Wheels—Different styles.  
Engine Frames—How to build the pattern to  
serve for various strokes.  
Spur Gears—How the teeth should be made.  
Bevel Gears—The manner of laying them out.  
How to Lay Out the Thread of a Worm for the Pattern.  
Worm Wheels—The way to get the angle of teeth  
and the manner of fastening them on.  
Sweeping Straight Winding Drums.  
Making Winding Drums from Patterns—  
cutting the groove.  
Making Shafts from Core Boxes.  
Making Shafts from Patterns.  
Shafts with Wrought-Iron Arms—An original way  
of making the Hub.  
A Machine for Sweeping Conical Drums—Designed  
by the author.  
Gear Teeth—One hundred and Twenty-eight full  
size different profiles of Gear Teeth from  $1\frac{1}{2}$  to  
3" Pitch, suitable for gears having from 14 to  
800 teeth.  
Table showing at a glance the required diam-  
eters of Gear Wheels for a given number of  
teeth and pitch.

sent, Postpaid, on receipt of price, by

**DAVID WILLIAMS, Bookseller & Publisher,**

96-102 Reade Street, New York.

**ZUCKER & LEVETT CHEMICAL CO.,**  
10, 12 & 14 Grand Street, New York, U. S. A.

**NICKEL PLATING OUTFITS,**  
Dynamos and Motors for Light, Power and Electro-plating.  
Send for Catalogue of  
NICKEL AND ELECTRO-PLATING SUPPLIES AND POLISHING MATERIAL.

## C. & C. ELECTRIC MOTORS AND DYNAMOS

Highest Electrical Efficiency.

Best Mechanical Construction.

**Electric Pumps, Hoists, Fans, Blowers, Etc.**

Large experience in and special attention paid to electrical transmission of power in factories.

**THE C. & C. ELECTRIC MOTOR CO.**

GENERAL OFFICES:

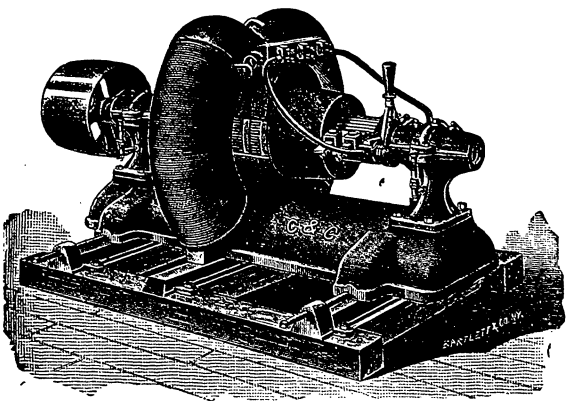
402 and 404 Greenwich St., New York.

BRANCH OFFICES:

CHICAGO,  
201 Madison Street.

BOSTON,  
63 Oliver Street.

AGENCIES IN ALL PRINCIPAL CITIES.



The Improved  
**WHARTON-HARRISON  
SAFETY BOILER,**  
For all Power and Heating Purposes.  
Single Boilers 2-240 H.-P.  
Batteries of any Capacity.

THE COCHRANE  
FEEDWATER HEATER.  
THE COCHRANE  
FEEDWATER HEATER & PURIFIER.

THE COCHRANE  
**SEPARATOR.**  
Horizontal or Vertical Form. For Obtaining  
Dry Steam. Purified Exhaust.

MANUFACTURED BY  
HARRISON SAFETY BOILER WORKS,  
Germantown Junction. PHILADELPHIA, PA.

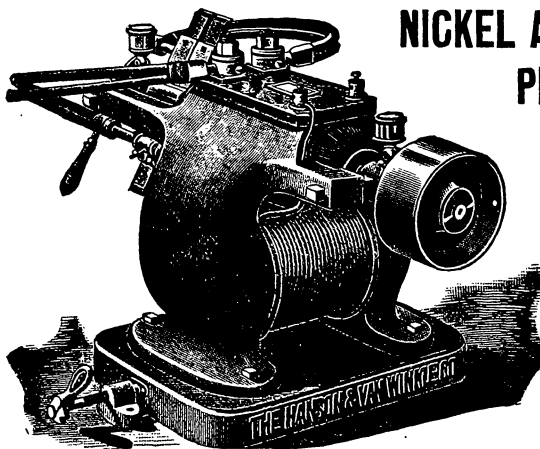
ESTABLISHED 1820.

INCORPORATED 1891

**The Hanson & Van Winkle Co.,**

MANUFACTURERS OF

**NICKEL AND ELECTRO  
PLATERS' MATERIAL.**



Nickel-Plating Outfits

From \$20 upward.

**DYNAMO-ELECTRO MACHINES**

For all purposes.

**The New H. & V. W. Dy-  
namo Machine.**

In sizes from No. 1 to No. 5.

**FROM \$100 TO \$500.**

These machines will be placed on 30 days' trial with responsible parties, and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.

219-221 Market St., Newark, N. J.;

81 Liberty St., New York.

85-87 South Canal St., Chicago, Ill.

**WE FURNISH EVERYTHING.**

**CHAPMAN VALVE  
MFG. CO.**

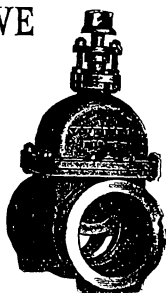
Manufacturers of

**VALVES & GATES**

For Water, Steam, Gas,  
Ammonia, &c.

**GATE FIRE HYDRANTS,**

With and without independent outlets.



We make a specialty of Valves with Bronze seats for High Pressure steam.

Works and General Office,

**INDIAN ORCHARD, MASS.**

Treasurer's Office,

72 Kilby and 112 Milk Streets,

**Boston, Mass.**

Chicago Office, 24 West Lake St. New York Office  
23 Platt Street.

Triple and Quadruple Expansion Engines  
and Boilers and their Management. By  
A. RITCHIE LEASK. 59 illustrations, 12mo, cloth, \$2.00

For Sale by David Williams 96-172 Reade St., N. Y.

**THE DETROIT DYNAMO CO.**

(INCORPORATED),

**DETROIT, MICH.,**

Electroplating,  
Electrotyping,  
Copper Refining,  
Arc and  
Incandescent  
Lighting.

MFRS. OF

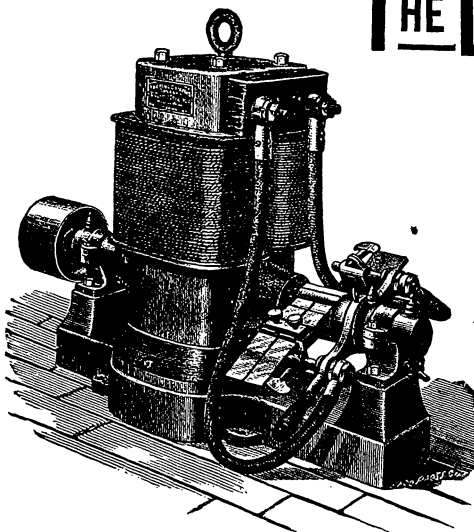
**"King"  
Dynamos**

Fan Ventilating

and Power Motors.

DEALERS IN

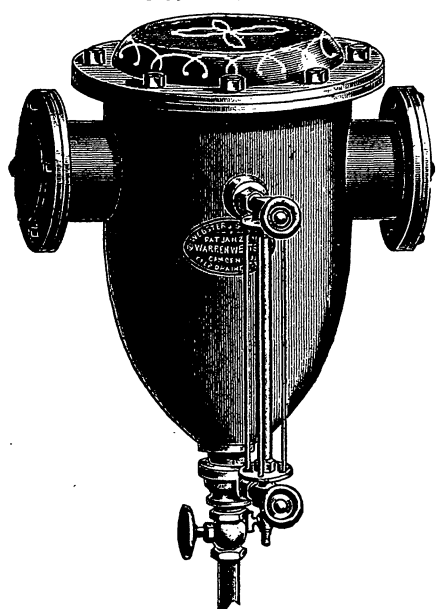
ELECTROPLATERS' SUPPLIES.



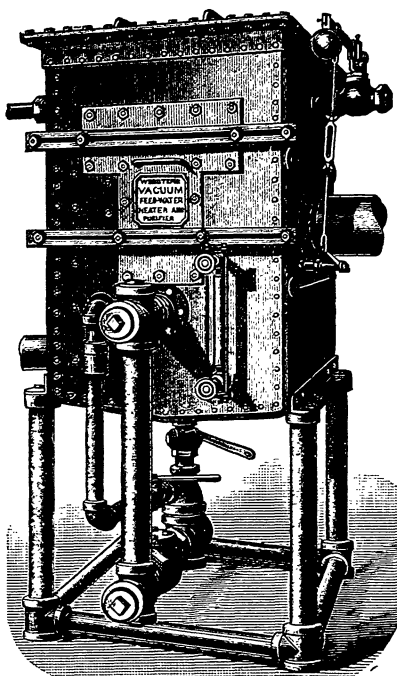
# THE 4000 HORSE POWER Webster Vacuum Feed Water Heater and Purifier

Is the largest Feed Water Heater in Practical Operation at the  
World's Columbian Exposition, and can be seen in Boiler  
Room of Machinery Hall.

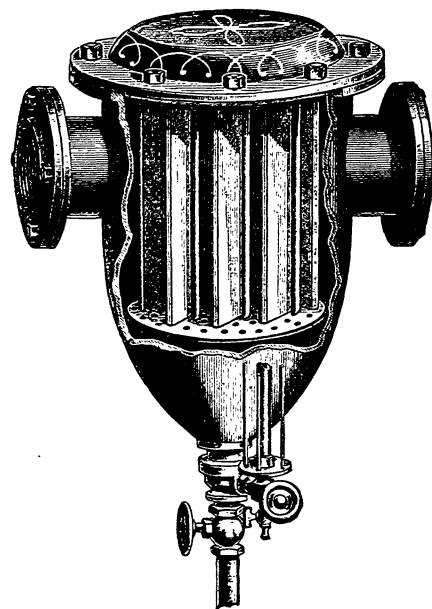
Patented Jan. 24, 1893.  
No. 490,461.



THE WEBSTER OIL EXTRACTOR.



THE WEBSTER VACUUM FEED WATER  
HEATER AND PURIFIER.



THE WEBSTER STEAM SEPARATOR.

## SOLE LICENSEES IN THE U. S. FOR THE "WILLIAMES" VACUUM SYSTEM OF **STEAM HEATING,**

UTILIZING EXHAUST STEAM WITHOUT BACK PRESSURE UPON ENGINES, PUMPS, ETC.

### SPECIALISTS

in examining steam plants where increased efficiency and greater economy is desired in heating feed water for steam boilers; also warming buildings by the utilization of exhaust steam without back pressure upon the engine irrespective of present heaters or methods employed.

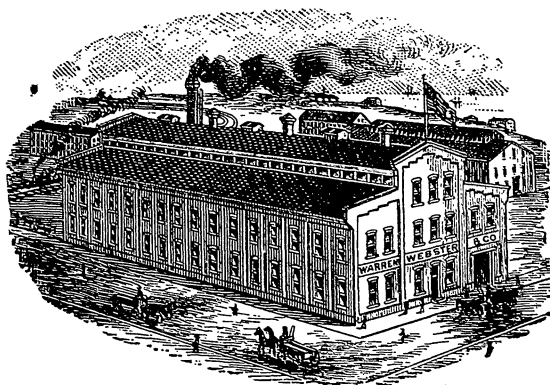
**EXAMINATIONS AND ESTIMATES FREE.**

**SEND FOR CATALOGUES.**

**FOR SALE.**—Feed Water Heaters, slightly used, of other makes, taken by us in part payment, where the Webster Vacuum Heater has recently been adopted. Send for List and Prices.

# WARREN WEBSTER & CO.,

Main Office  
and Works, CAMDEN, N. J.



**BRANCHES:**  
CHICAGO,  
NEW YORK.

**AGENCIES:**  
BOSTON,  
PITTSBURGH,  
HARRISBURG,  
CLEVELAND,  
CINCINNATI,  
BUFFALO,  
SAN FRANCISCO.  
Darling Bros., 112 Queen St., Montreal, Can





# THOROUGH INSPECTIONS

And Insurance against loss or damage to property and loss of life and injury to persons caused by

## Steam Boiler Explosions

J. M. ALLEN, Pres. WM. B. FRANKLIN, Vice-Pres. F. B. ALLEN, 2d Vice-Pres. J. B. PIERCE, Sec. and Treas.

### BOARD OF DIRECTORS:

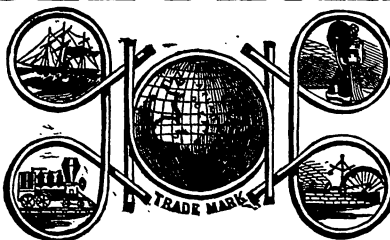
J. M. ALLEN, President.  
 FRANK W. CHENEY, of Cheney Brothers Silk Manufacturing Co.  
 CHARLES M. BEACH, of Beach & Co.  
 DANIEL PHILLIPS, of Adams Express Company.  
 RICHARD W. H. JARVIS, President Colt's Fire Arms Manufacturing Co.  
 THOMAS O. ENDERS, of the United States Bank.  
 LEVERETT BRAINARD, of the Case, Lockwood & Brainard Co.  
 GEN. WM. B. FRANKLIN, late Vice-President Colt's Pat. Fire Arms Mfg. Co.  
 NELSON HOLLISTER, of the State Bank, Hartford.

HON. HENRY C. ROBINSON, Attorney at Law, Hartford.  
 HON. FRANCIS B. COOLEY, of the National Exchange Bank, Hartford, Conn.  
 A. W. JILLSON, late Vice-Prest. Phoenix Fire Insurance Co., Hartford, Conn.  
 EDMUND A. STEADMAN, President of the Fidelity Co., Hartford, Conn.  
 GEORGE BURNHAM, Baldwin Locomotive Works, Philadelphia.  
 HON. NATHANIEL SHIPMAN, Judge U. S. Circuit Court.  
 C. C. KIMBALL, Prest. Smythe Manufacturing Co., Hartford, Conn.  
 PHILIP CORBIN, of P. & F. Corbin, New Britain, Conn.

## GLOBE PACKING.

FOR STEAM ENGINES, PISTON RODS  
 MINING PUMPS,  
 HYDRAULIC LIFTS. ICE MACHINES, ETC.

None genuine without this TRADE-MARK on the MUSLIN cover.

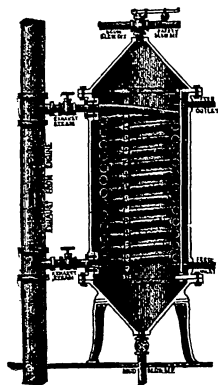


### AGENCIES:

The Burnet Co., New York; W. D. Allen & Co., Chicago; Ensign & McGuffee, San Francisco; T. K. Carey & Bro., Baltimore; Charlotte Supply Co., Charlotte; Waters & Garland, Louisville; Southern R. & Supply Co., Richmond, and others.

Ask your supply dealers for it or order from agents or from makers,

**JAS. H. BILLINGTON & CO.**  
 PHILADELPHIA, PA.



## THE AMERICAN FEED WATER HEATER

Received the First Prize at the

Mechanics' Association Fair, - Boston, Mass.

What you get when you buy the AMERICAN HEATERS:

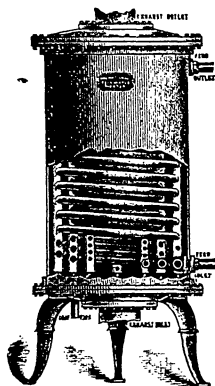
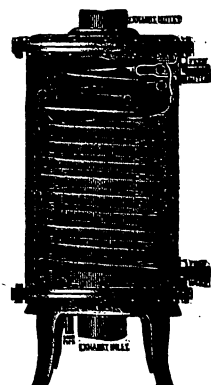
COPPER COILS,  
 SOLIDLY BRAZED,  
 GUN METAL FITTINGS  
 AND CLAMP STAYS,  
 STEEL SHELLS,

NO RUSTING OUT,  
 NO LEAKY JOINTS,  
 NO TROUBLE FROM EXPANSION,  
 NO BACK PRESSURE,  
 NO OIL IN BOILER.

We guarantee this Heater to be the Most Durable, Effective and Cheapest.

**WHITLOCK COIL PIPE CO.,**

27 South Street, - - - Elmwood, Conn.



## The National Feed Water Heater

is a BRASS COIL HEATER, delivering water to the boilers at 212° Fahrenheit. It is low in price, but unequalled in efficiency. 500,000 H. P. in daily use attests its merits.

Coils and Bends of Iron, Brass, and Copper Pipe.

**THE NATIONAL PIPE BENDING CO.,**

98 River St., New Haven, Conn.



## THE EYNON-EVANS MANUFACTURING CO.,

Patentees and  
 Manufacturers of

## THE EYNON-KORTING COMPOUND INJECTORS.

Extra Heavy Globe and Angle Valves. Brass Castings up to 5000 lbs.

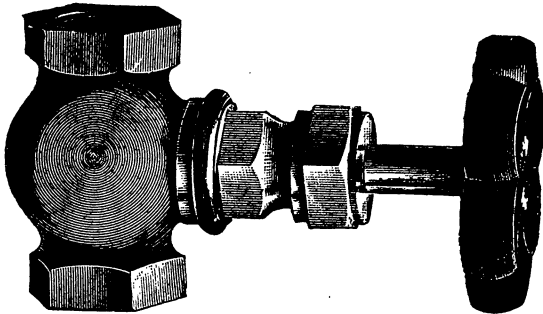
Blowers, Ventilators, Blast Nozzles, Exhausters, Brass Syphons, Acid Syphons, Condensers.

Fifteenth and Clearfield Sts., Philadelphia, Pa.

**BLAST FURNACES,  
ROLLING MILLS,  
STEEL WORKS,  
MINES, ETC.,  
ETC.**



**OIL WELLS,  
REFINERIES,  
ELECTRIC LIGHT PLANTS  
WATER WORKS, ETC.,  
ETC.**



**McNAB & HARLIN MFG. CO.,**  
—MANUFACTURERS OF—  
**BRASS COCKS AND VALVES**  
For Steam, Water and Gas.

Wrought Iron Pipe and Fittings. Plumbers' Materials. Seamless  
Brass and Copper Tubes.

Factory, PATERSON, N. J.

56 JOHN ST., N. Y.

Catalogue and Price-List will be sent to the Trade with their first order, or by express, if desired, before ordering.



**THE CONTINENTAL IRON WORKS.**

West and Calyer Streets, BROOKLYN, N. Y.,

—SOLE MANUFACTURERS OF—

**CORRUGATED FURNACES, FOR MARINE AND  
LAND BOILERS.**

Made in sizes from 28 in. to 60 in. diameter, with flanged or plain ends.

Thos. F. Rowland, Pres. Warren E. Hill, }  
Thos. F. Rowland, Jr., Treas. Chas. H. Corbett, } Vice-Pres.

Take Ferry from East 10th or 23d Streets, N. Y., to Greenpoint.

**AUTOMATIC REGISTER.**

The most accurate and reliable counter manufactured. Made entirely of metal.



Handsomely finished. Can be used on any machine. Send for circular.

**G. EDW. OSBORN & CO.,**  
391, 393 & 395 State St., New Haven, Conn.

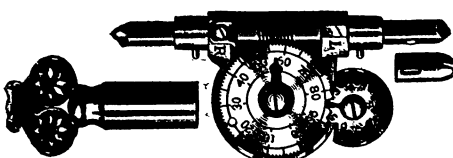
**DURANT COUNTING MACHINES.**



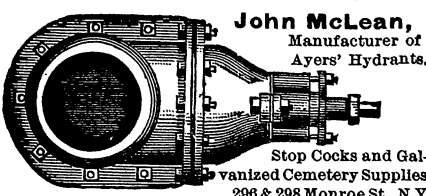
Send for  
Catalogue  
to

W. N. DURANT, 234 22d St., Milwaukee, Wis.,  
Exhibit in Gallery, Manufacturers Building,  
World's Columbian Exposition, Section  
E, Col. T-108 and active exhibit in Machinery  
Hall.

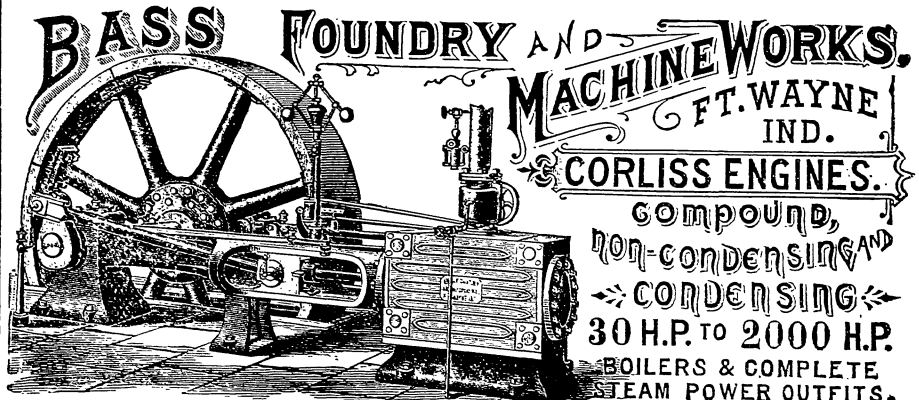
**CHURCH'S DOUBLE AND SINGLE  
SPEED INDICATORS.**



CHURCH & SLEIGHT, 109 FULTON ST., N. Y.



Stop Cocks and Galvanized Cemetery Supplies  
206 & 298 Monroe St., N. Y.

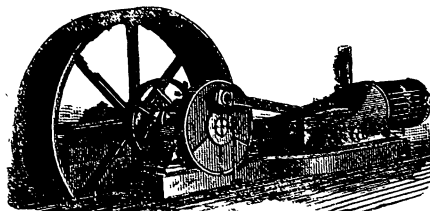


**WILLIAM TOD & CO.**  
YOUNGSTOWN, OHIO.



**PORTER-HAMILTON  
ENGINE**  
Blowing Engines,  
Hydraulic Cranes & Accumulators  
Heavy Special Machinery.  
ENGINE CATALOGUE ON APPLICATION.

**BUCKEYE ENGINE COMPANY'S EXHIBIT AT THE WORLD'S FAIR.**



20 and 32½ and two 36 x 48 Triple  
Expansion, 1250 H.-P.  
14 x 24 and 28 x 24 Cross Com-  
pound, 325 H.-P.  
11 and 21 x 16 Tandem Compound  
185 H.-P.  
16½ x 30, 180 H.-P.  
13 x 21, 130 H.-P.  
13 x 16, 13 H.-P.

A cordial invitation is extended to all persons interested in engineering to make our exhibit in Machinery Hall their headquarters while visiting the Fair.

The PHOENIX IRON WORKS COMPANY, Meadville, Pa., respectfully invites

# YOU

to call and see their exhibit of "DICK & CHURCH" high speed engines, World's Columbian Exposition, Chicago, Ill., Machinery Department Building, Section C, Column No. 7.

One Single Cylinder Engine of 250 H.-P.  
One Tandem Compound Engine of 250 H.-P.  
One Triple Expansion Engine of 500 H.-P.

ESTABLISHED 1879. INCORPORATED 1893.

## ERIE ENGINE WORKS

(CLEVELAND & HARDWICK.)

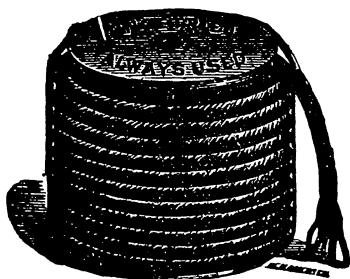


**ERIE, PA.**

Manufacturers of

### STEAM ENGINES AND BOILERS.

**ROLLASON GAS ENGINES**  
RELIABLE AND ECONOMICAL  
Send for Catalogue, etc. HAVEMEYER BLDG. NEW YORK



Send for a Sample of  
**Morrison's Patent Self-Lubricating Packing,**  
**ROBT. MORRISON,**  
5034 Arsenal St., St. Louis, Mo

## The Practical Brass and Iron Founder's Guide.

A Treatise on Brass Founding, Molding, the Metals and their Alloys, etc.

By **JAMES LARKIN,**

Late Conductor of the Brass Foundry Department the Penn Works, Philadelphia.

A New Revised and Greatly Enlarged Edition.

### CONTENTS:

Among the most important and entirely new sections of this edition of this valuable and popular book are the following:

Behavior of Metals and Alloys in Melting and Congealing; Malleable Iron Castings; Wrought Iron or Mitis Castings; Manufacture of Steel Castings; Casting of Brass; Casting of Bronze; Bell Founding; Chill Casting; Casting without Core; Casting on to other Metals; Casting Iron and other Metals upon Lace, Embroideries, Fern Leaves and other Combustible Materials; Some Modern Bronzes.

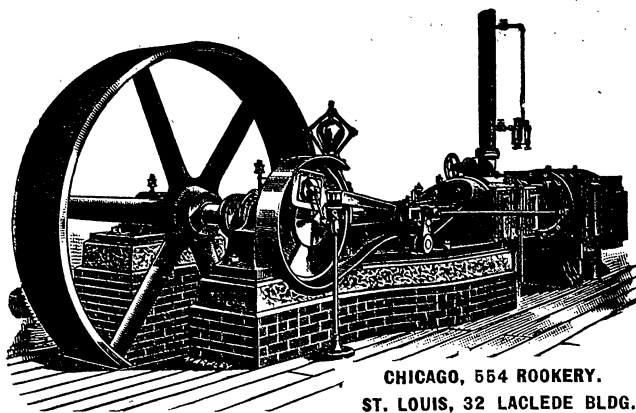
In one volume, 12mo, 400 pages, \$2.50.

Sent, post-paid, on receipt of price by

**DAVID WILLIAMS,**

*Bookseller and Publisher,*

96-102 READE ST., N. Y.



**SOUTHWARK  
FOUNDRY AND  
MACHINE CO.,**  
Philadelphia, Pa.

Sole Makers of

**THE PORTER-ALLEN  
AUTOMATIC ENGINE,**  
SIMPLE, COMPOUND  
OR TRIPLE EXPANSION.

Also Builders of

**BLOWING ENGINES,  
REVERSING ENGINES,  
CENTRIFUGAL PUMPS,  
BOILERS, TANKS, ETC.**

CHICAGO, 554 ROOKERY.

ST. LOUIS, 32 LACLEDE BLDG.

## POWER FROM GASOLINE.

DIRECT FROM THE TANK.

### CHEAPER THAN STEAM.

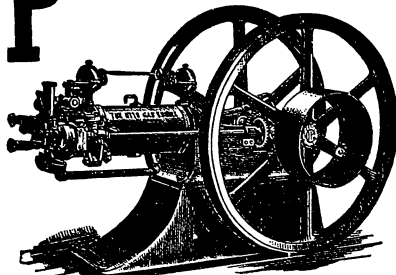
No Boiler. No Steam. No Engineer.

For Use Everywhere.

### OTTO GASOLINE ENGINES,

Stationary or Portable.

1 to 50 H. P. 8 to 20 H. P



Running Expenses, Less than one cent per horse power per hour.

For large engines, one-half cent per horse power per hour.

Suitable for all manufacturing purposes, Electric Lighting, Town Water Supply.

The Best Auxiliary Power for Night Work.

## OTTO GAS ENGINE WORKS,

33d and Walnut Sts.,  
**PHILADELPHIA, PA.**

**CHICAGO OFFICE:**  
245 Lake St.

**BOSTON OFFICE:**  
19 Pearl St.

E. L. MAXWELL, Pres.

C. A. MOORE, Vice-Pres.

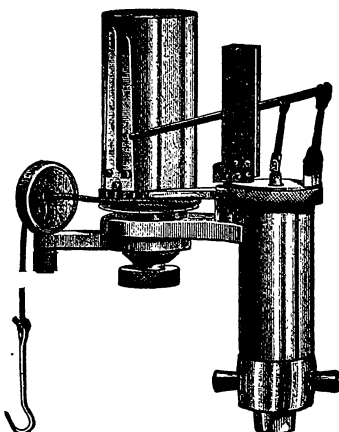
H. S. MANNING, Treas.

M. LUSCOMB, Sec

## THE ASHCROFT MANUFACTURING COMPANY

SOLE MANUFACTURERS OF

### THE TABOR STEAM ENGINE INDICATOR.



The only instrument that will make accurate diagrams at either high or low speeds. In use all over the World where accuracy is desired. Approved and adopted by United States Government on the new Cruisers.

Use the Coffin Averaging Instrument; determines the area of any irregular figure. Gives mean effective pressure (M. E. P.) of an indicator diagram without computation. Absolute accuracy. Easy to manipulate. No liability to error. One diagram per minute measured without effort.

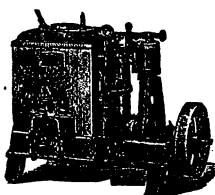
Also Steam and Vacuum Gauges, with Patent Seamless Drawn Tube, Steam Traps, Packer Ratchet Drills, Stanwood Cutters, Marine Clocks, Engine Revolution Counters, Test Gauges, Oil Cups, Test Pumps, Locomotive Spring Balances, Steam Whistles, Salinometers, and all instruments for Measuring Steam, Air, Gas, or Water.

Office and Salesroom, 111 Liberty St., N. Y.

Factory, Bridgeport, Conn.

Address all Letters to P. O. Box 3754, New York.

Exhibit at World's Columbian Exposition, Section No. 25 Columns K. 24 and 25, Main Center Aisle, Machinery Hall.



### The Shipman Automatic Steam Engine.

PETROLEUM OR KEROSENE FUEL.

1, 2, 6, 8 Horse-Power, Single.

8 and 22 " " Compound.

STATIONARY or MARINE.

No SKILLED ENGINEER.

—SEND FOR CATALOGUE.—

**SHIPMAN ENGINE CO.,**

200 Summer St., Boston, Mass.

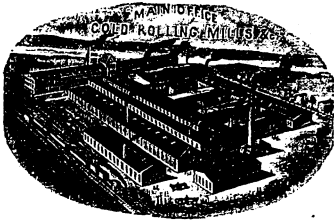
New Orleans

New York,

Chicago,

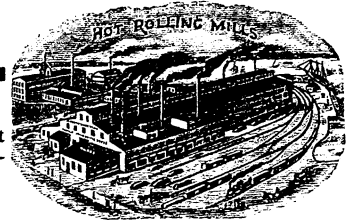
San Francisco.

Oiler Department, THE WILMOT & HOBBS MFG. CO., Store, 20 Murray St., New York.

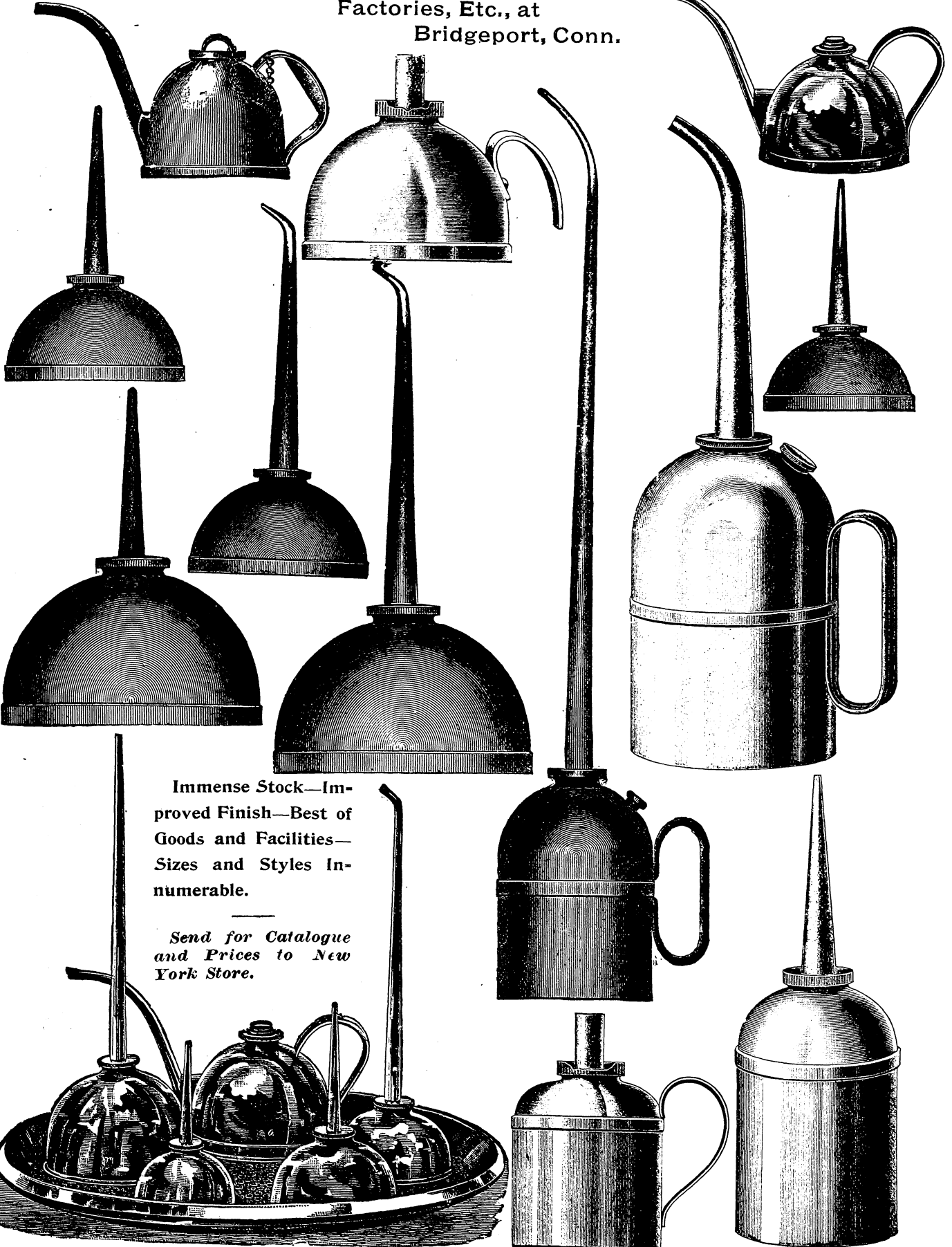


Sole Manufacturers of  
COPPERIZED C. R. "SWEDON" **STEEL** ANTI-RUST **OILERS.**  
Trade Marks Registered. Patents applied for.

They are HEAVILY COPPER-PLATED INSIDE to prevent rusting and the oil from becoming gritty. The outside perfectly resembles BURNISHED COPPER.



Hot and Cold Rolling Mills,  
Factories, Etc., at  
Bridgeport, Conn.



Immense Stock—Im-  
proved Finish—Best of  
Goods and Facilities—  
Sizes and Styles In-  
numerable.

Send for Catalogue  
and Prices to New  
York Store.

Awarded the Grand Prize at Late Paris Exposition.

SEND FOR THIS BOOK

FREE ON APPLICATION.

**THE BABCOCK & WILCOX CO. WATER TUBE**

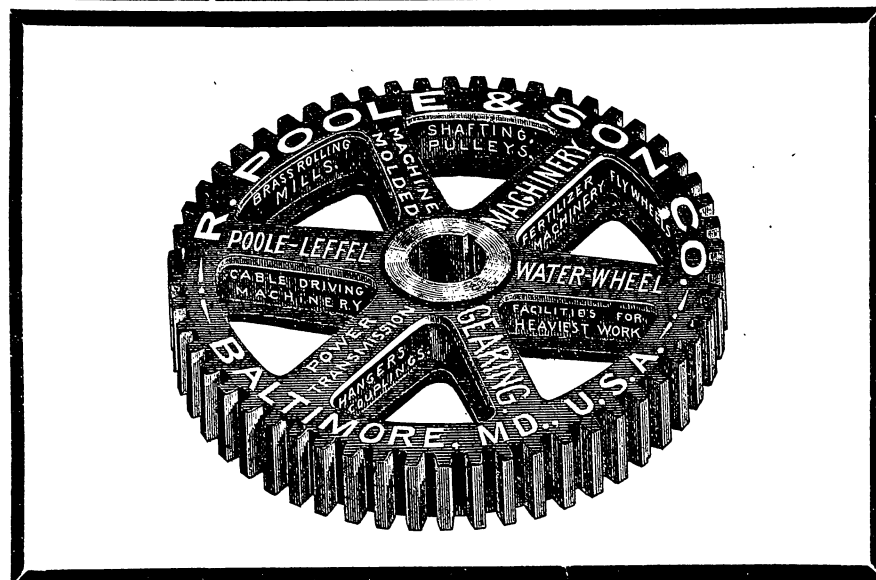
30 CORTLANDT ST. N.Y.

BRANCH OFFICES:

BOSTON, MASS. 8 OLIVER ST.  
PHILADELPHIA, PA. 32 N. 5TH ST.  
PITTSBURGH, PA. 408 LEWIS BLOCK  
CLEVELAND, O. 412 PERRY-PAYNE BLDG.  
CHICAGO, ILL. 45 S. JEFFERSON ST.  
MINNEAPOLIS, MINN. 604 CORN EX.  
NEW ORLEANS, LA. 57 CARondelet ST.  
HAWAII, CUBA. 116 CALLE DELAHUAMA.

**STEAM BOILERS**

MANUFACTORIES IN UNITED STATES, SCOTLAND, FRANCE, GERMANY & AUSTRIA.



## ROCK DRILLING AND AIR COMPRESSING MACHINERY

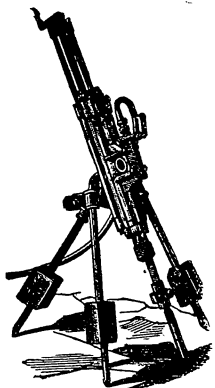
—FOR—  
TUNNELS, QUARRIES,  
MINES, RAILROADS,

And wherever Ore and Rock are to be Drilled  
and Blasted.

**RAND DRILL CO.,**

23 Park Place, New York.

Branch Offices: Monadnock Building, Chicago; Ishpeming, Mich.;  
1316 18th Street, Denver; Sherbrooke, P. Q., Canada; Apartado 830,  
Mexico City.



## IRON CASTINGS of all kinds to order.

Drill Press and PLANER CHUCKS

UNIVERSAL PORTABLE RADIAL DRILLS. HIGH PRESSURE VERTICAL ENGINES.  
HORIZONTAL STATIONARY ENGINES.

CRANES, Hand and Power, Steam and Hydraulic.

Diamond Pointed Core PROSPECTING DRILLS.

Can Turn 22 Feet Diameter.

MACHINERY of all kinds built to order.

MINERAL LANDS PROSPECTED and Artesian Wells Bored, by Contract.

**PENNSYLVANIA DIAMOND DRILL & MANUFACTURING CO. - BIRDSBORO, PA.**

CHICAGO MACHINERY & ENGINEERING CO., Western Sales Agents, Chicago, Ill.

## BOSTON GEAR WORKS

37 Hartford St., Boston, Mass.

HEADQUARTERS FOR GEARS.

Book on Gears, 170 Illustrations, \$1.00. Job Gear  
Cutting of all kinds. Spur, Bevel, Spiral, Ratchet,  
Worm, Rack, Elliptic, Index Plates, &c. Very small  
or large. Send for 1892 Catalogue; 600 sizes of Gear  
FREE to any business firm.

**BEVEL GEARS**

PLANED PERFECTLY BY PATENTED PROCESS

**GLEASON TOOL CO.**

ROCHESTER, N.Y.

## BOOKS

### Mechanical and Steam Engineering.

Mechanic's, Millwright's and  
Engineer's Pocket Com-  
panion.

With American additions. By W. TEMPLE-  
TON. Leather; tuck .....\$2

Steam and Machinery Manage-  
ment.

A guide to the arrangement and economical  
management of machinery, with hints on  
construction and selection. By M. POWIS  
BALE, M. Inst. M. E., A. M. Inst. C. E. 191  
pages; cloth.....\$1

Richards' Steam Engine Indi-  
cator.

A treatise on the development and appli-  
cation of force in the steam engine. Fourth  
edition, revised and enlarged. By C. T.  
PORTER. 273 pages; 20 plates; cloth.....\$3

Thermo-Dynamics, Heat Motors,  
and Refrigerating Machines

By PROF. DR. VOLSON WOOD. Third edition,  
revised and enlarged; 452 pages; cloth....\$4

Mechanics' and Engineers'  
Pocket Book.

By CHAS. H. HASWELL. Fifty-fifth edition;  
356 pages; leather.....\$4

Steam Boiler Explosions in The-  
ory and Practice.

By Prof. R. H. THURSTON. Second edition  
illustrated; cloth.....\$1.50

Manager's Hand-Book of  
Modern Rules,

Tables and Data for Civil and Mechanical  
Engineers, Millwrights and Boiler Makers,  
Tool Makers, Machinists and Metal Worker's  
Iron and Brass Founders, &c. By W. S.  
HUTTON. Thick 8vo, half-bound.....\$6

A Manual of Steam Boilers,  
their designs, construction and operation.  
For technical schools and engineers. By  
PROF. R. H. THURSTON. Second edition;  
183 engravings in text; 671 pages; cloth...\$5

Treatise upon Cable or Rope  
Traction,

as applied to the working of street and other  
railways. Revised and enlarged from *En-  
gineering*, London. By J. BUCHNALL SMITH.  
Illustrated; 195 pages; cloth.....\$2.50

Complete Practical Machinist.

By JOSHUA ROSE. Embracing lathe work,  
vise work, drills and drilling, taps and dies,  
hardening and tempering, the making and  
use of tools, &c. Fifteenth edition; 356  
illustrations; 430 pages.....\$2.50

The Car Builder's Dictionary.

An illustrated vocabulary of terms, which  
designate American railroad cars, their  
parts and attachments. Revised and en-  
larged edition. By MATTHIAS N. FORNEY,  
M.E.; 358 pages; cloth.....\$3

Modern American Locomotive  
Engines,

their Design, Construction and Manage-  
ment. A practical work for practical men.  
By EMORY EDWARDS, M.E. Illustrated by  
78 engravings; 383 pages; cloth.....\$2

Modern Steam Engines.

An elementary treatise upon the steam en-  
gine, written in plain language, for use in  
the workshop, as well as in the drawing  
office, giving full explanations of the con-  
struction of modern steam engines, includ-  
ing diagrams, showing their actual opera-  
tion; together with complete but simple  
explanations of the operations of various  
kinds of valves, valve motions and link  
motions, &c., thereby enabling the ordinary  
engineer to clearly understand the prin-  
ciples involved in their construction and  
use, and to plot out their movements upon  
the drawing board. By JOSHUA ROSE, M.E.  
Illustrated by 422 engravings; 321 pages, 16  
x 12 inches; cloth.....\$6

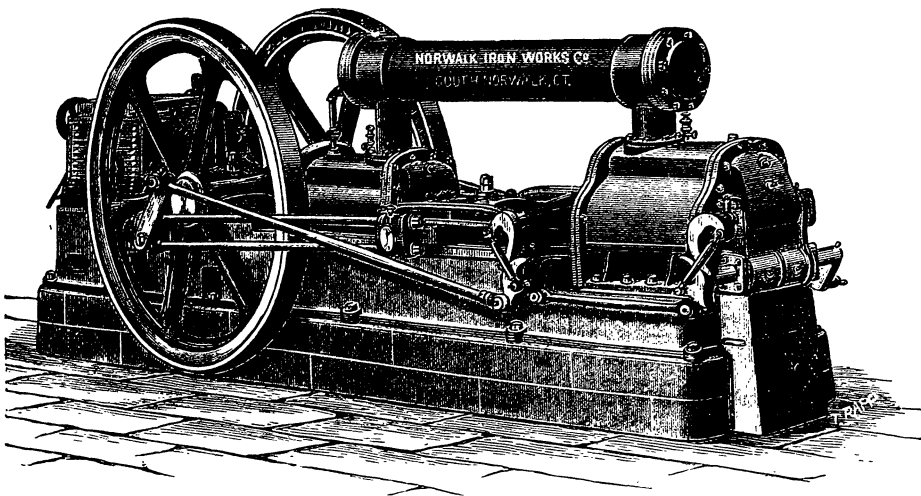
Any Book published sent, post-paid, upon  
receipt of price, by

**DAVID WILLIAMS,**

Publisher and Bookseller,

96 - 102 Reade St., New York.

# Air Compressors.



**THE NORWALK IRON WORKS CO., South Norwalk, Conn.**

## DEAN BROTHERS

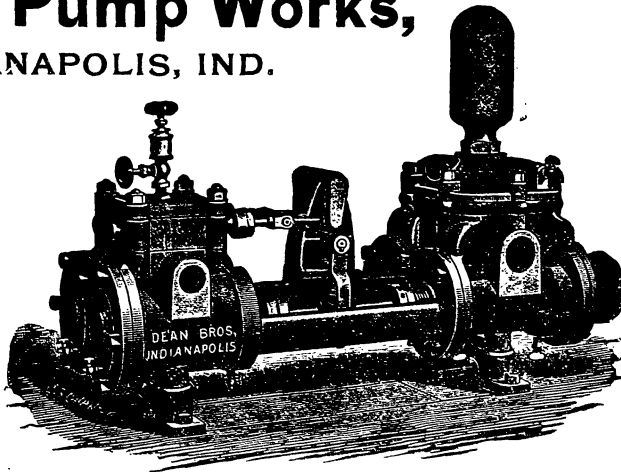
### Steam Pump Works,

INDIANAPOLIS, IND.

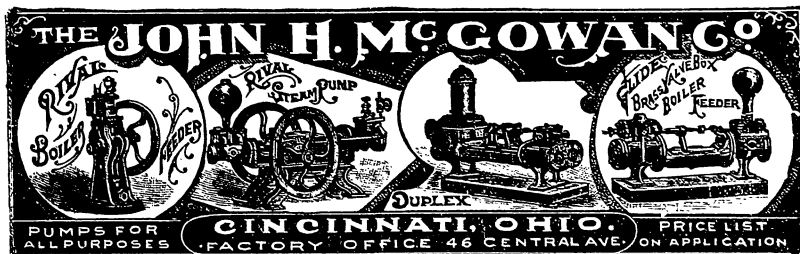
DUPLEX PUMPS.

SINGLE PUMPS.

DEEP WELL  
PUMPS.



Send for Catalogue  
and Prices.



Brass Founders and Mfrs. of every description of Brass and Iron body goods for steam, gas and water

## Worthington Steam Pumps

### CONDENSERS and WATER METERS.

HENRY R. WORTHINGTON,

86 & 88 LIBERTY STREET, NEW YORK.

BOSTON, ST. LOUIS, PHILADELPHIA, DENVER. CHICAGO

The WATERBURY-FARREL FOUNDRY & MACHINE CO., Waterbury, Connecticut,  
Builders of Rolling Mill Machinery, Special Machines for finishing and making goods from  
Sheet Brass, Copper, Steel Silver, &c., POWER PRESSES, HYDRAULIC PRESSES,  
Drop Presses, Foot Presses, RIVET MACHINES, Gang Slitters, Grinding Machines, Steel  
Rolls, Wire Mill Machinery, Tube Drawing Machinery, Dies, &c.

**CHEAPEST. HANDIEST. SIMPLEST.**

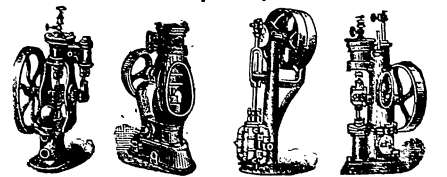
Handling Dirty, Gritty and Sandy Liquids, without Wear, Oil or Care. Pumping outfits for Contractors, Mining, Irrigating, Railroad, Quarry, Drainage and Manufacturing purposes. Second-hand Engines, Boilers, Pumps, and other Machinery always on hand. Exchanging.

**MASLINS,** 165-167 First St. Jersey City, N.J.

**SEAMLESS** Made in all sizes  
**COPPER FLOATS** and shapes by a  
**AND** New Process.  
**AIR CHAMBERS,** Guaranteed to stand 50% more pressure than any other make.  
**SEND FOR PRICES.**  
**SPRINGFIELD BRASS CO.,**  
**SPRINGFIELD, MASS.**

Send for Prices.

**VALLEY PUMP CO.**  
Easthampton, Mass.



The GEO. BURNHAM CO.,  
Worcester, Mass  
CATA-

**LOGUE**

The Best 16-in  
Lever Drill Made



# Ferracute Machine Co.

BRIDGETON, N. J., U. S. A.,

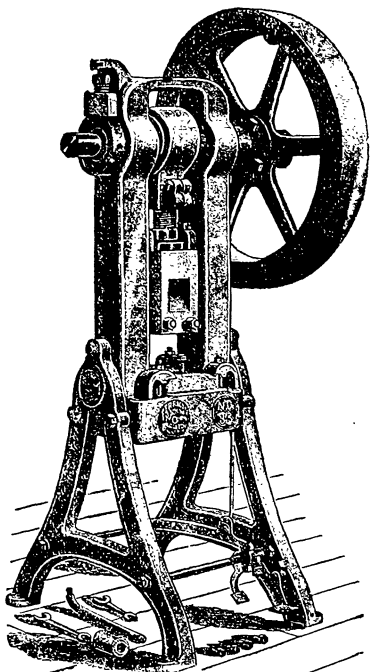
MANUFACTURERS OF

FOOT AND POWER

## PRESSES, DIES,

AND ALL OTHER

Tools for Bar and Sheet Metals



Send for Illustrated Catalogue containing sizes, weights and prices of one hundred kinds of Presses and other Tools for Brass Goods, Locks, Hardware, Nuts, Washers, Drop Forgings, Railroad, Bridge and other General Machine Shop Work, &c. Also for Tinware, Cans, Boxes, Lamps, Gas Fixtures and Silverware, &c., &c.

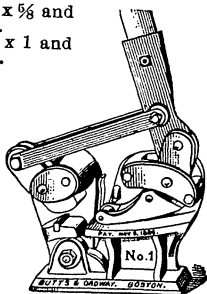
### B. & O. TIRE UPSETTER. SURE GRIP.

No. 1, Upsets 3 x 5/8 and smaller.  
No. 2, Upsets 4 x 1 and smaller.

IT IS WITHOUT A  
FAULT. ONE MOTION  
DOES IT ALL.

Every machine is tested and warranted to give satisfaction. We confidently offer this Upsetter as the best to be had.

Send for Price.  
BUTTS & ORWAY,  
500 Atlantic Ave.,  
BOSTON, MASS.



Handy Tables from Thurston's Steam Engine Manual. By Prof. R. H. THURSTON. For use in Laboratory Computations in Technical Schools. 8vo, cloth.....\$1.50

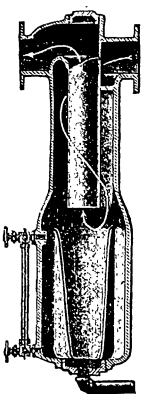
or Sale by David Williams 96-102 Reade St., New York.

**THE BERRYMAN AND THE HIGHEST I. B. DAVIS MAKERS**

**FEED WATER PURIFIER GRADE ONLY AND SON HARTFORD, CT.**

**PROVIDED WITH U SHAPED TUBES IT NEVER LEAKS**

SEND FOR CATALOGUE A.



### TO OBTAIN DRY STEAM PLACE A STRATTON SEPARATOR

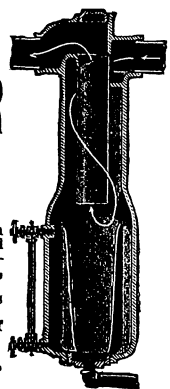
In Your Steam Pipe.

Over 400,000 Horse Power in use.

This is the only apparatus that automatically separates water from steam, and secures the maximum of Economy, Efficiency and Safety. These Separators are used by the U. S. Navy, by the leading Electric Light Cos., Sugar Refineries, Paper Mills, Water Works, Railroads and Steam Vessels. Steam Chimneys or Drums are unnecessary when this Separator is used.

Send for our new publication, "Dry Steam the Foundation of Economy." Sent free on application.

The GOUBERT MFG. CO., Sole Mfrs., 32 Cortlandt St., New York.



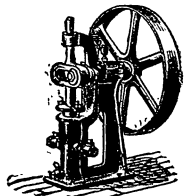
### POWER BOILER FEED PUMP.

From 2 to 80 horse-power. Neat in design. Self-contained easy motion. Durable and reliable. Strong built, large bearings.

Send for Catalogue and Prices and mention this paper.

C. O. LUCAS & CO..

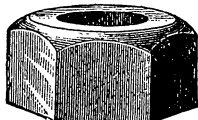
Greenville, Ohio.



## BOILERS

WE make a better stationary tubular boiler, make it of flange steel, with weldless braces and eclipse manholes, and sell them for one-third less than the old style. Send for lithographs and detail illustrations.

Fulton Steam Boiler Works & Foundry,  
RICHMOND, IND.



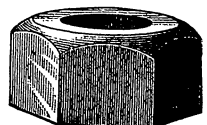
### PORTCHESTER BOLT & NUT CO.

Port Chester N. Y.

MANUFACTURERS OF

**BOLTS, NUTS, RIVETS and WASHERS**  
CHAMFERED AND TRIMMED.

SQUARE AND HEXAGON NUTS A SPECIALTY.



# The Brown Hoisting and Conveying Machine Co.,

CLEVELAND, OHIO, U. S. A.,

Sole manufacturers of the

## "BROWN HOIST"

A NEW AND COMPLETE SYSTEM FOR HANDLING OF MATERIALS.

The Brown Patent Cable Tramway system.

The Brown Patent Suspended Beam Tramway system.

The Brown Patent Bridge Tramway system.

The Brown Patent Shed Tramway system.

The Brown Patent Furnace Stock Distributer.

The Brown Patent Warehouse Tramway system.

The Brown Patent Sewer Machine Tramway system.

The Brown Patent Continuous Elevated Tramway system.

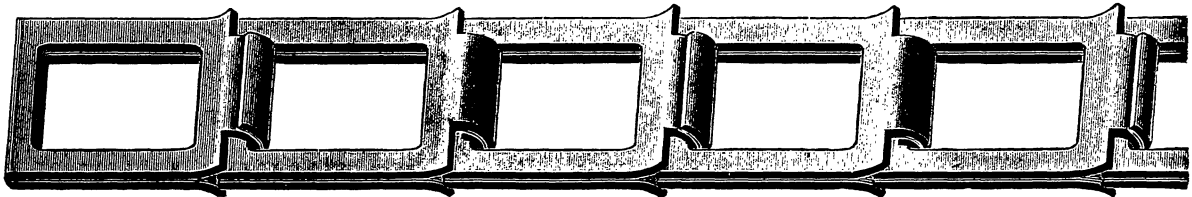
The Fayette-Brown Patent Automatic Furnace Hoist.

The Brown Patent Friction Clutch Hoisting Engine.

Self-Dumping Buckets, Skip Cars, Friction Clutches, etc.

The Most Perfect Clutch.

ROBERTS MFG. CO. - - - PITTSBURGH, PA.



PATENT DETACHABLE STEEL LINK BELTING,

Sprocket Wheels and Shafting.

Send for Catalogue and reduced Price-List.

### JEFFREY CHAIN BELTING.

Also MALLEABLE, WROUGHT, STEEL AND SPECIAL CHAINS for

Elevating and Conveying Machinery

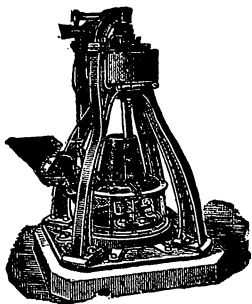
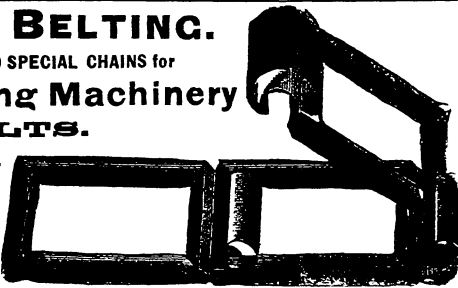
DRIVE BELTS.

Send for 1893 Catalogue and Reduced Price-List.

THE JEFFREY MANUFACTURING CO.

COLUMBUS, OHIO, U. S. A.

New York Branch, 163 Washington St.

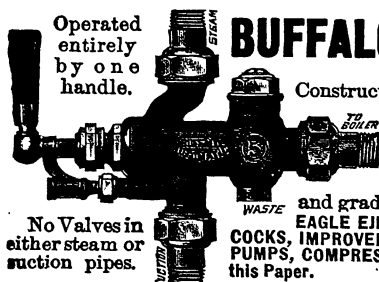


### THE GRIFFIN MILL

A perfect pulverizer of all refractory substances by either the wet or dry process. It works better and at less expense than any other Mill, and is conceded to be the only perfect pulverizing Mill manufactured.

For free illustrated pamphlet address

BRADLEY FERTILIZER CO., 92 State St., Boston.



Operated entirely by one handle.

### BUFFALO AUTOMATIC INJECTOR

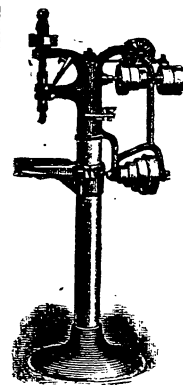
A GRADING INJECTOR.

Construction and operation is such that water supply is always in proportion to supply of steam admitted and can be graded to feed continuously with steam from 20 to 140 pounds. Works perfectly whether lifting or taking supply from city pressure. Operated entirely by one handle, both in stopping and starting and grading supply of steam and water.

EAGLE EJECTORS, DUPLEX FLUE SCRAPPERS, FELTSCHEN GAUGE COCKS, IMPROVED GLASS OIL CUPS AND LUBRICATORS, CYLINDER OIL PUMPS, COMPRESSION GREASE CUPS, Etc. Send for Catalogue. - Mention this Paper.

SHERWOOD MFG. CO., Buffalo, N. Y.

EUROPEAN AGENTS, Green & Boulding, 21 Featherstone St., London, E. C.



### The Norton Drills

for light, sensitive and rapid drilling. 1, 2, 3, 4 or more spindles, sensitive or automatic feed. To drill from 0 to 1/2 inch holes. The latest and best. Most convenient, sensitive and durable drills on the market. Have balanced spindles and balanced tables. Write for prices and description, or for special machinery.

THE

NORTON & JONES MACHINE TOOL WORKS, PLAINVILLE, CONN.

## PIPE

FROM 1-8 TO

24 in. Diameter

CUT, BENT,

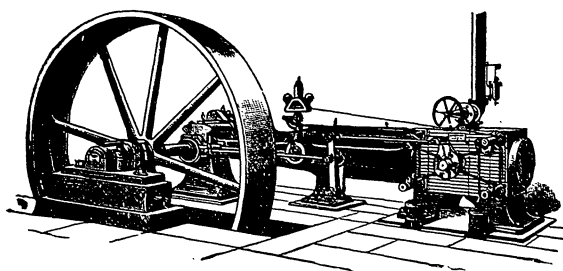
FITTED and ERECTED Anywhere in the U.S.

BEST, FOX & CO.,

25th & Railroad Sts.,

Pittsburgh, Pa.

THE LANE & BODLEY CO.,



Cincinnati, O.

### ENGINES,

ALL SIZES

Simple and Compound, CORLISS ENGINES A SPECIALTY.

Heavy Slide Valve Engines.

Shafting, Hangers, Pulleys,

Belt Elevator, etc.

ALEXANDER BROS.

BEST OAK BELTING.

PHILADELPHIA.

## LEVIATHAN BELTING.



Positively unequalled for Strength, Durability and Traction Power; unaffected by Heat, Steam or Water.

Belts for Main Driving and work of a heavy nature a specialty.

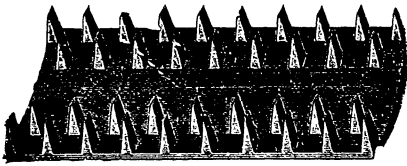
### MAIN BELTING COMPANY,

Sole Manufacturers,  
1219-1235 Carpenter St.,  
PHILADELPHIA.

248 Randolph Street, Chicago.  
120 Pearl Street, Boston.

Send for Price-Lists and Samples.

### Talcott's Original Wilson Belt Hooks

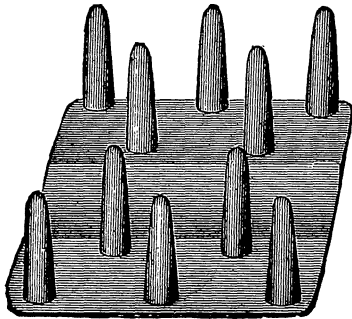


W. O. TALCOTT, Providence, R. I.

MANUFACTURER OF

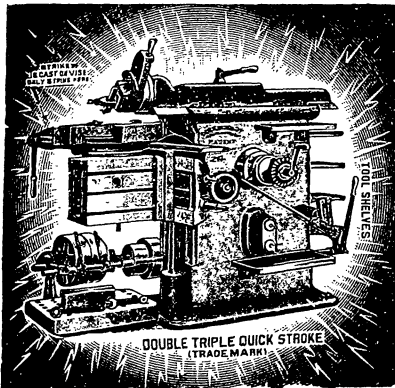
Four Styles of BELT HOOKS, Including 134 Sizes.  
SEND FOR CATALOGUE.

### Thacher's Patent BELT FASTENERS.



Manufactured by  
The Claffen Manufacturing Co., Cleveland, O.  
Office, 71 and 73 Ontario St.

FOR THE  
"Double Triple Quick Stroke"  
**SHAPER**  
WRITE TO  
GOULD & EBERHARDT, Newark, N.J.



12 in., 16 in., 20 in., 24 in., 26 in., 30 in. stroke.

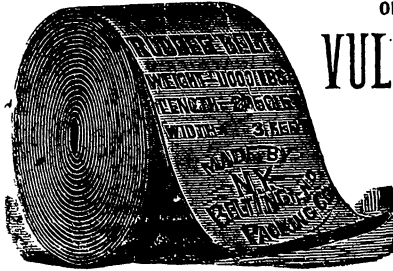
## NEW YORK BELTING & PACKING CO. LTD

JOHN H. CHEEVER,  
President.

15 Park Row, New York.

Oldest and Largest Manufacturers in the U. S. of

## VULCANIZED RUBBER FABRICS



For Mechanical Purposes.

### MACHINE BELTING

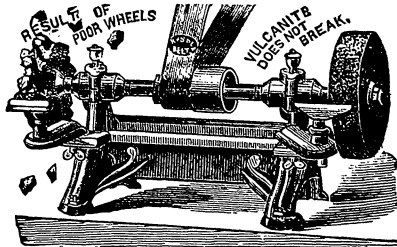
With Smooth Metallic Rubber Surface.



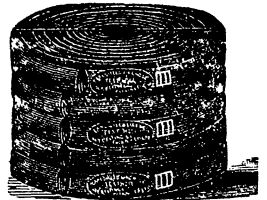
### RUBBER TEST HOSE

COTTON "CABLE" HOSE, CIRCULAR, WOVEN, SEAMLESS ANTISEPTIC

For the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories and Steamers.



### Rubber Cement.



### THE ORIGINAL SOLID VULCANITE EMERY WHEELS.

RUN EASY and SAFE, COOL and TRUE. ARE MORE DURABLE—HENCE CHEAPER. A trial will convince you of this. KNIFE GRINDING WHEELS A SPECIALTY.

Rubber Goods to Order for all Mechanical Purposes.

#### SALESROOMS:

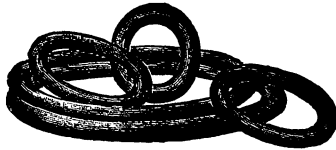
PHILADELPHIA, 308 Chestnut St.  
BOSTON, 44 Summer St.  
CHICAGO, 151 Lake St.  
DENVER, 1601-1611 17th St.  
CHARLESTON, 140 Meeting St.  
CINCINNATI, 227 West 4th St.  
MINNEAPOLIS, 200 1st Ave. South.  
CLEVELAND, 176 Superior St.

#### SALESROOMS:

SAN FRANCISCO, 17 Main St.  
DETROIT, 16-20 Woodward Ave.  
BALTIMORE, 12 N. Charles St.  
NEW ORLEANS, 8-12 N. Peters St.  
KANSAS CITY, 1311 and 1313 W. 12th St.  
ST. LOUIS, 616 Locust St.  
DALLAS, 173 Elm St.

## H. O. CANFIELD,

MOULDED BRIDGEPORT, CONN.



RUBBER GOODS FOR MECHANICAL PURPOSES.

Small moulded work a specialty. Send for estimates for moulds and work.

## Smoke Stacks

— AND —

## Boiler Fronts

When painted with Dixon's Silica-Graphite Paint will resist the action of salt air, sulphurous vapors, etc., and give entire satisfaction.

So say those who have used it for many years. Send for circulars to

JOS DIXON CRUCIBLE Co.,  
JERSEY CITY, N. J.

# E. W. BLISS CO.,

## 11 ADAMS STREET, BROOKLYN, N. Y.

When in Chicago, call at our Exhibit, Section  
28 Machinery Hall Annex.

WIRE HANDLE  
MACHINE,  
No. 150.

ENTIRELY AUTOMATIC.  
WILL MAKE OVAL OR OBLONG  
HANDLES.  
WILL WORK ROUND, OVAL OR  
SQUARE WIRE.  
CAPACITY, 85 PER MINUTE.  
SEND US SAMPLE HANDLES FOR  
ESTIMATES.

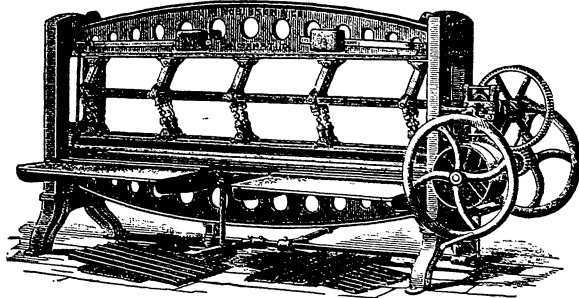
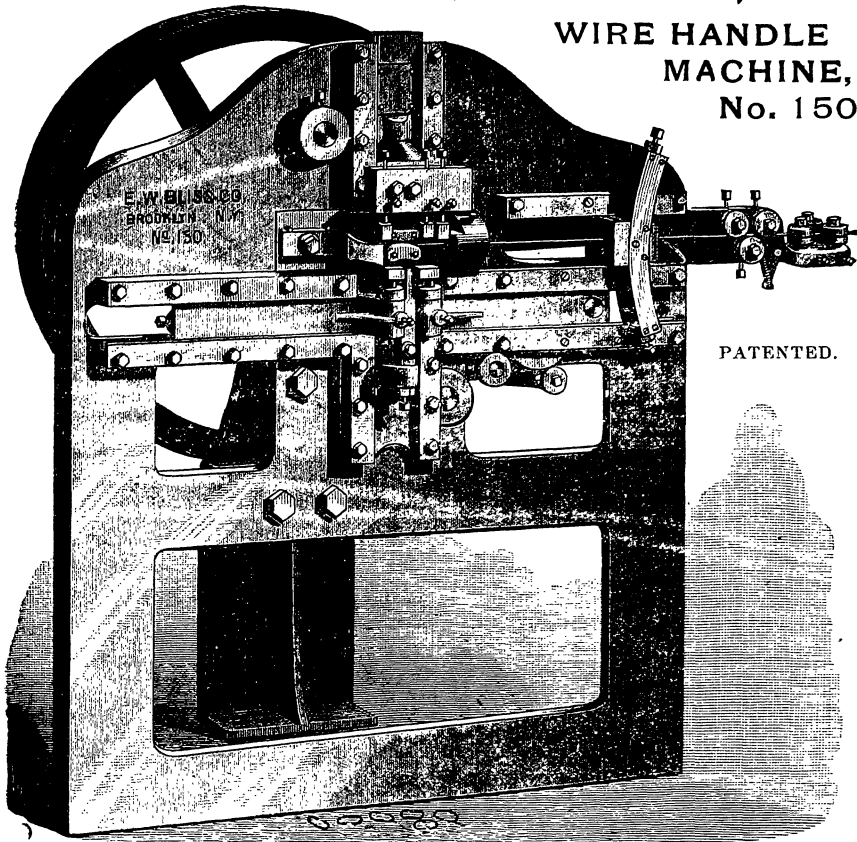
PATENTED.

## PRESSES, DIES, SPECIAL MACHINERY.

CHICAGO,

14 N. CANAL ST.

Owners Also of THE STILES & PARKER PRESS CO.



### Roofing Machine.

For forming sheet metal Roofing, Siding, Ceiling, Weather  
Boarding, Skylight Bars, Metal Lath, Gutters, Ridge Cap,  
Escalloped Steel Sheets and Cattle Troughs. Made by

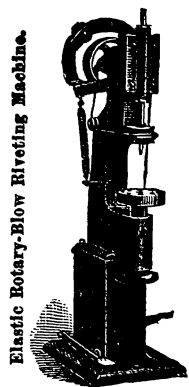
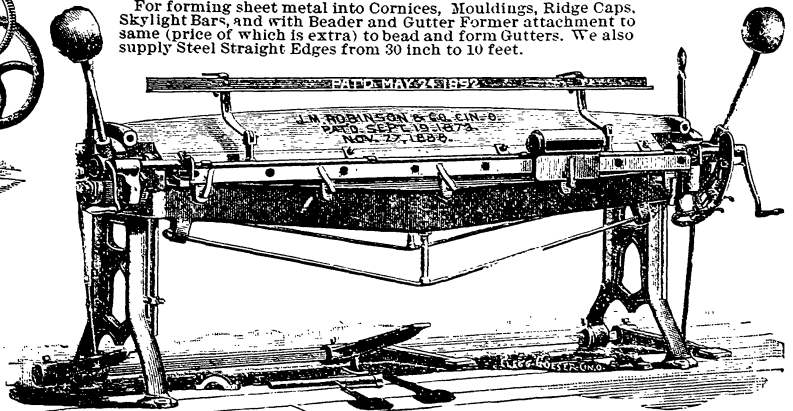
J. M. ROBINSON & CO.,

225-229 West 2d St.,

CINCINNATI, O.

### The "Globe" Cornice-Brake.

For forming sheet metal into Cornices, Mouldings, Ridge Caps,  
Skylight Bars, and with Beader and Gutter Former attachment to  
same (price of which is extra) to bead and form Gutters. We also  
supply Steel Straight Edges from 30 inch to 10 feet.



Elastic Rotary-Blow Riveting Machine.

### JOHN ADT & SON,

New Haven, Conn.

BUILDERS of MACHINERY for HARDWARE MANUFACTURE.

BUTT MILLING MACHINERY,

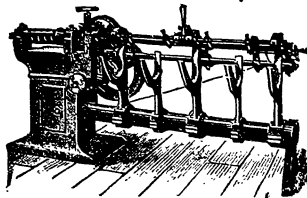
BUTT DRILLING MACHINERY,

RIVETING MACHINES,

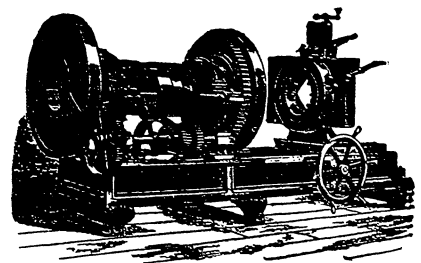
WIRE STRAIGHTENING  
MACHINERY,

FOOT PRESSES,

SPRUE CUTTERS,  
ETC.



Automatic Wire Straightening and Cutting Machine.



BIGNALL & KEELER MFG. CO., St. Louis, MO.

MANUFACTURERS OF

Peerless Duplex Pipe Cutting and Threading  
Machines. Send for Catalogue.

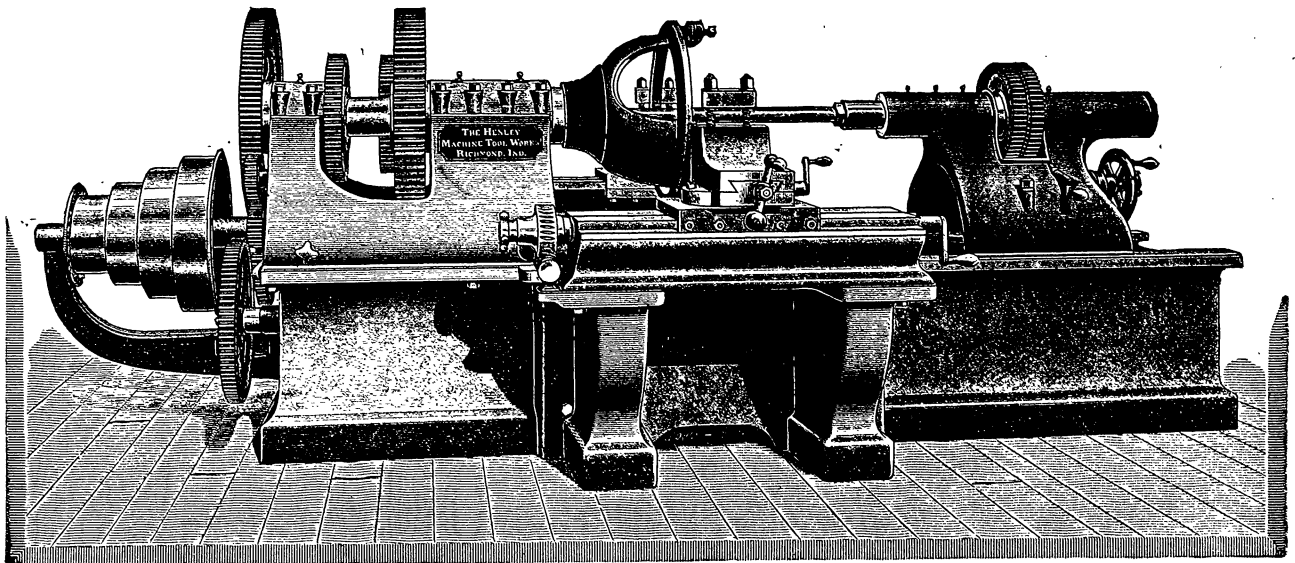
Our Prices are Low and our Goods are the Best.

# RIEHLE

BROS. TESTING MACHINE CO., Phila., have issued a new  
describing and illustrating all the various styles of their U. S. Standard Testing Ma-  
chinery with the special appliances. Marble Machinery, Rope Twisters, Loam Mills,  
Riehle-Roble Frictionless Ball Screw Jacks, Iron and Wooden Trucks, &c., &c. are  
described. It is desired to have one of these Catalogues in the office of every Super-  
intendent, Purchasing Agent, Engineer or Manufacturer using such Machinery. A  
copy will be mailed free of charge to those who may apply.

# CAT. No. 3

# PULLEY LATHES



Patented Feb. 17, 1891; June 14, 1887.

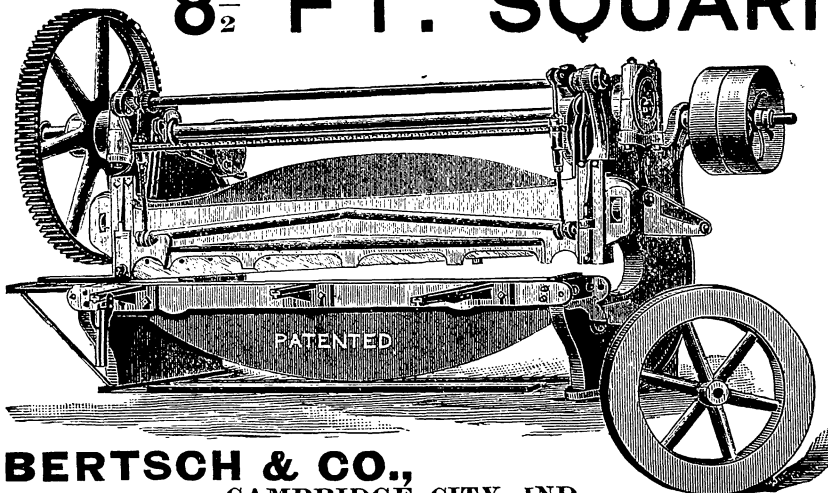
This cut represents the 42-inch Lathe. The 60-inch Lathe is of same design, but much heavier throughout. The 30-inch Lathe is of same general construction, with the bed supported on feet at each end.

These Lathes are especially designed for Simultaneously Boring and Turning Pulleys, both straight and crowning face, Cone Pulleys, Gear Blanks, and a variety of other work.

MANUFACTURED BY

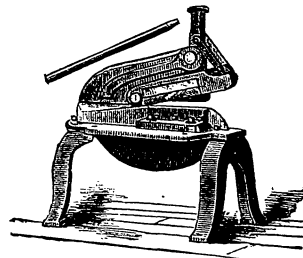
**THE HENLEY MACHINE TOOL WORKS, Richmond, Indiana.**

## 8 $\frac{1}{2}$ FT. SQUARING SHEAR



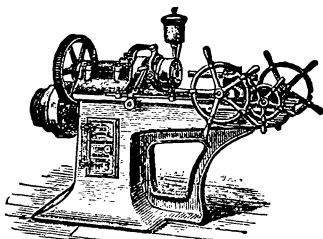
**BERTSCH & CO.,**  
CAMBRIDGE CITY, IND.

For squaring and trimming  $\frac{1}{4}$ -inch plates and lighter; has 15 in., 18 in. or 21 in. throat; has Improved Quick-acting Hold-down Automatic Clutch, Drop-leaf Tables Patent Center Bearings Supports, Patent Safety Cross Head or Knife Bar arrangement.



Improved Compound Lever Stock Shears. Three Sizes: adapted for Slitting, Trimming and Squaring Sheets, &c.

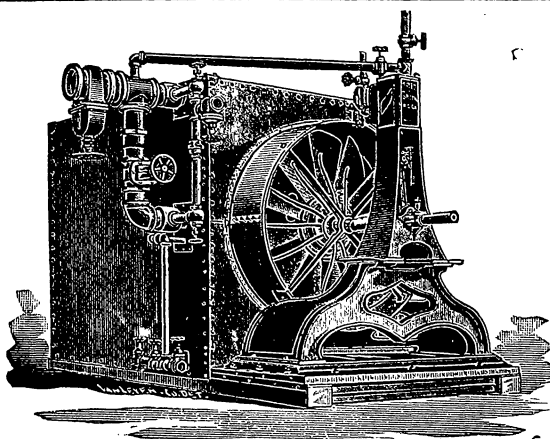
**THE NATIONAL MACHINERY CO.,**  
TIFFIN, OHIO  
— MANUFACTURERS OF —  
**BOLT AND NUT**



**MACHINERY**  
OF EVERY DESCRIPTION.

*Upsetters and Benders,*  
*Car Link and Pin Machinery.*

CATALOGUE SENT ON APPLICATION.



Boston,  
Chicago,  
New York.

**HUYETT & SMITH MFG. CO., DETROIT, MICH.**

**BOOKS.**

YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS**, Publisher and Bookseller 96-102 Reade Street, New York.

For Heating  
Schools,  
Churches,  
Factories,  
Stores,  
Machine and  
Railroad Shops.

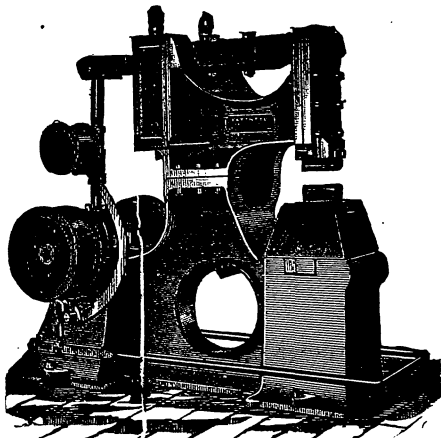


# LINK-BELT

ENGINEERING CO  
NICETOWN,  
PHILA.  
49 DEY ST.  
NEW YORK

Elevators, Conveyors, Manila Rope Power Transmission Machinery, Ewart Detachable Link Belting  
Dodge Chain, Howe Chain, &c. Western connection.  
[CHICAGO,] [LINK BELT MACHINERY CO.]

## JENKINS' POWER HAMMERS.

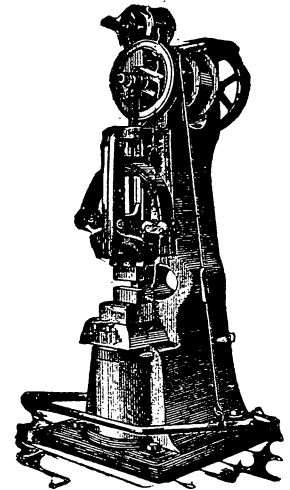


Adjustable and elastic stroke, nicety of regulation, efficiency of action, simplicity and durability of construction and the absence of leather straps, steel springs and all complication, combine to make this hammer the favorite wherever used.

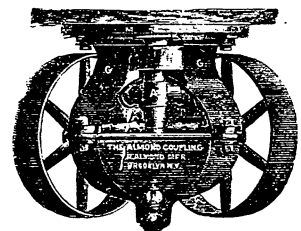
JENKINS & LINGLE,  
BELLEFONTE, PA.

## If You Use Power Hammers

Write to us for Circulars.  
BELDEN MACHINE CO.  
NEW HAVEN, CONN.



Chicago Office, 65 South Canal Street.



THIS CUT REPRESENTS  
ALMOND'S PAT. QUARTER-TURN COUPLING  
To Replace Mule Pulleys and Bevel Gears.  
It is a noiseless quarter-turn countershaft, self-contained, perfectly lubricated, and gives no trouble. Send for particulars.

T. R. ALMOND, 83 and 85 Washington Street, Brooklyn, N. Y.

**G. A. CROS**  
Manufacture  
**PRESSE**  
SPECIAL MACHINE  
SHEET METAL  
176 178 So. Clinton

**BY CO.**  
S. DIES  
CHINERY  
WORKERS  
Str., Chicago, Ill.

**BARNES**  
Hand and Foot Power Machinery,  
FOR CARPENTERS AND BUILDERS.

Complete Line of Seven Machines.  
Hand Circular  
Rip Saw  
Combined Rip and Cross-Cut Saw (with Scroll Saw and Boring Attachments).  
Scroll Saw, Former, Mortiser, Tenoner & Lathe

Discounts to the trade on application. Send for Catalogue and Price-List.  
**W. F. & JOHN BARNES CO.,**  
69 Ruby Street, ROCKFORD, ILL.  
ENGLISH AGENTS, CHAS. CHURCHILL & CO.,  
21 Cross Street, Finsbury, E. C., London

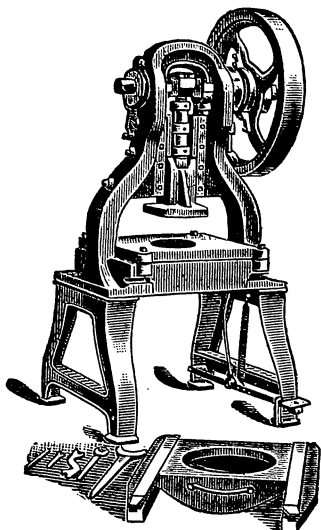
## IMPROVED CUTTING-OFF TOOL.



Will cut off work 12 or 14 inches from the chuck, without danger of breaking the blade or spoiling the work, without the use of center rest.

Saves Blades,  
No Filing Off.  
Made of best steel case hardened.

HURLEY BROS., Manufacturers, Hartford, Ct.  
Send for Price.



## Presses, Dies, Presses, OF ALL KINDS FOR Sheet Metal Ware.

Difficult and Intricate Drawing  
Stamping, Embossing, Wiring,  
Blanking and Combination  
Dies a Specialty.

SUBMIT SAMPLES AND WRITE FOR PRICES.

**Stark Machine & Tool Co.,**

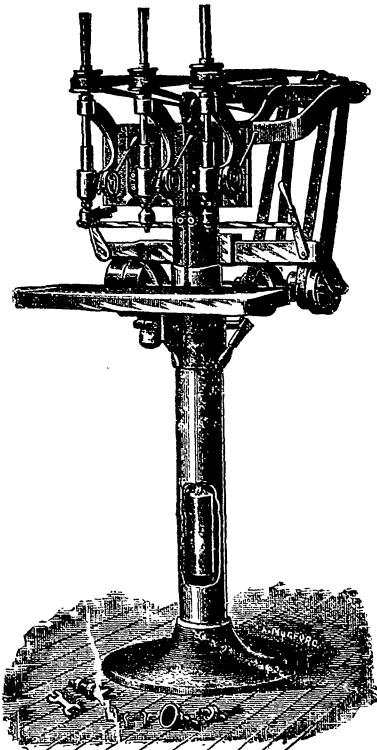
BUFFALO, N. Y.

Send for Catalogue and mention "The Iron Age."



**SIGOURNEY DRILLS.**

IMPROVED.

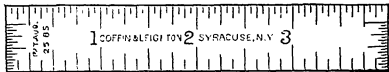


Sensitive, Strong and Interchangeable

One, Two and Three Spindles.

Counter-balanced Spindles and Tables. Vertical range of table, 30 inches, and it will swing to right or left.

SEND FOR CIRCULAR.

**THE SIGOURNEY TOOL CO.,**  
Hartford, Conn.**MACHINISTS' SCALES,**  
PATENT END GRADUATION.

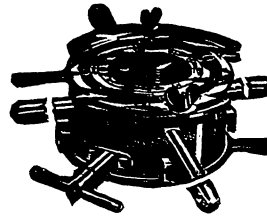
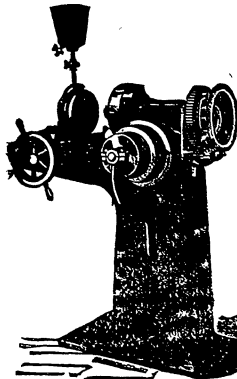
Liberal Discount to the Trade. Send for List.

COFFIN &amp; LEIGHTON, Syracuse, N. Y.

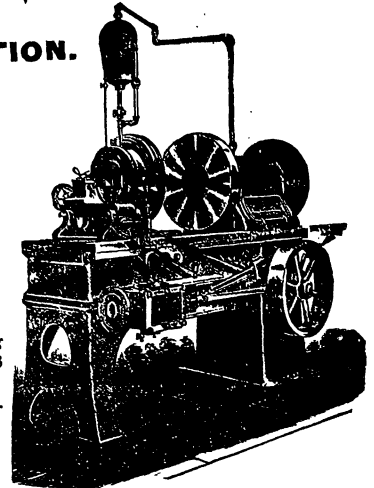
**DRILL PRESSES**  
MFRS. OF  
**THE LARGEST**  
**VAR. I. E. T. Y.**  
SEND FOR NEW  
80 PAGE CATALOGUE  
JUST OUT  
**DWIGHT SLATE**  
**MACHINE CO.**  
**HARTFORD, CONN.**



**ARMSTRONG MAN'G. CO.**  
OUR ADJUSTABLE STOCKS AND DIES are universally acknowledged to be the BEST! We also make all our Tools on the same principle of the Best Material and Workmanship, and always with a view of time and labor saving in their use.

**JARECKI MFG. CO. (Limited), Erie, Pa.**PIPE THREADING AND  
CUTTING TOOLS OF  
ALL DESCRIPTION.

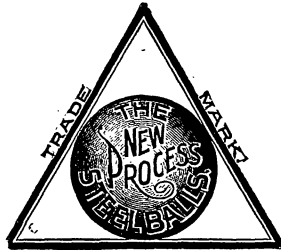
Write for Catalogue showing the most complete line of 1-8 inch to 16 inch for hand, belt, engine and with electric motor attachment.



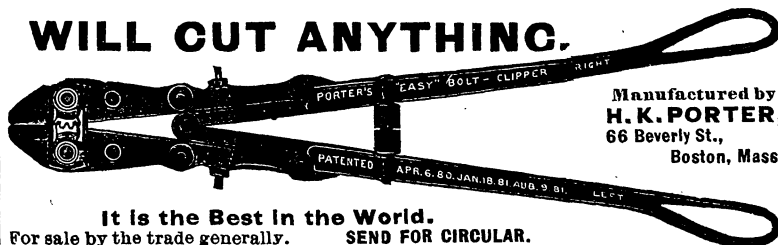
We can furnish Bolt Threading Attachment for this Machine.

IF YOU WANT ANYTHING IN THE LINE OF  
**DROP PRESSES · DROP HAMMERS ·**  
**STAMPS OR AUTOMATIC**  
**DROP LIFTERS**

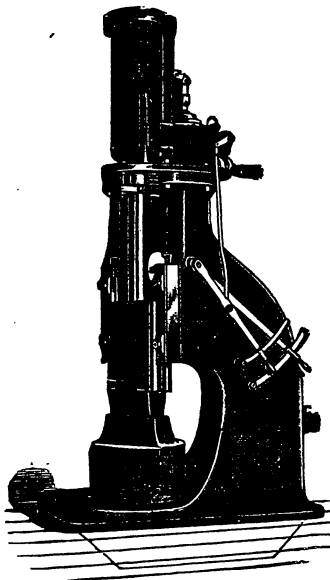
SEND FOR CATALOGUE TO

*Miner & Peck Mfg. Co.*  
New Haven, Conn.  
LARGEST LINE IN THE MARKET.**STEEL BALLS**

For all purposes, from Bicycles to the heaviest class of machinery. Write to us for prices and samples, also for information when in doubt about the proper application of balls to heavy bearings.

**GRANT ANTI-FRICTION BALL CO.,**  
Fitchburg, Mass.**Bullock Bellows Co.,**  
Cleveland, Ohio.Largest  
Mfrs.  
in the  
World**THE "EASY" BOLT CLIPPER.**  
**WILL CUT ANYTHING.**Manufactured by  
**H. K. PORTER,**  
66 Beverly St.,  
Boston, Mass.It is the Best in the World.  
For sale by the trade generally. SEND FOR CIRCULAR.

23,000 Sold.



# Bement, Miles & Co.,

PHILADELPHIA, PA.,

Builders of

## Metal-Working Machine Tools

For railroad shops, locomotive and car builders,  
machine shops, steam forges, shipyards, boiler  
shops bridge works

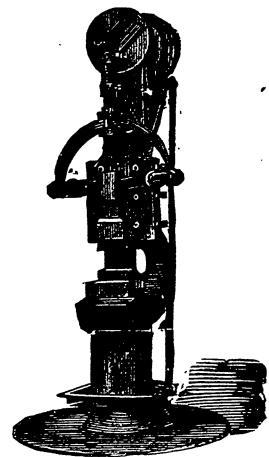
**Steam Hammers for Working Iron  
or Steel.**

NEW YORK OFFICE. Equitable Building.

GEORGE PLACE, Agent

## DEAD-STROKE POWER HAMMER

CONSTRUCTION IMPROVED.  
Prices Reduced.  
Seven Sizes.  
5 to 350 Pounds.



The 15 and 25 pound sizes are specially adapted to  
Flemishers' use, the other sizes for general forging.  
Send for circular and references.

**DIENELT & EISENHARDT,**

MAKERS,

1310 Howard St., Philadelphia.

# THE STURTEVANT

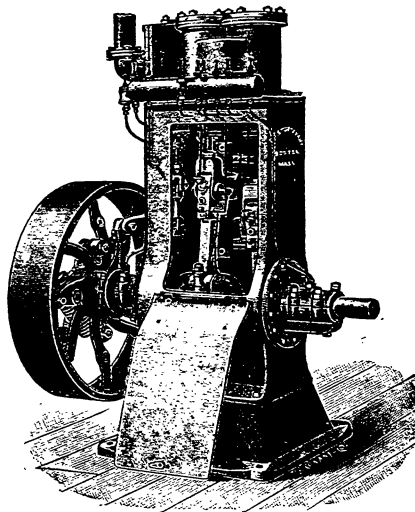
DOUBLE ENCLOSED  
HIGH SPEED  
**AUTOMATIC  
ENGINES,**

For Electric Lighting and Similar Work.

**B. F. STURTEVANT CO.,**

BOSTON, MASS.

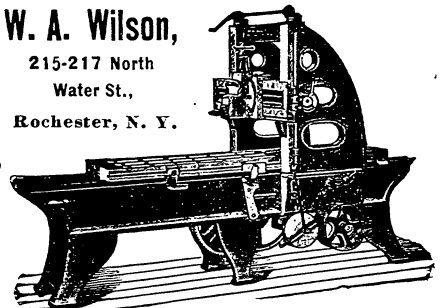
BRANCHES:  
91 Liberty St., NEW YORK. 16 So. Canal St., CHICAGO.  
135 North Third St., PHILADELPHIA.



**W. A. Wilson,**

215-217 North  
Water St.,

Rochester, N. Y.

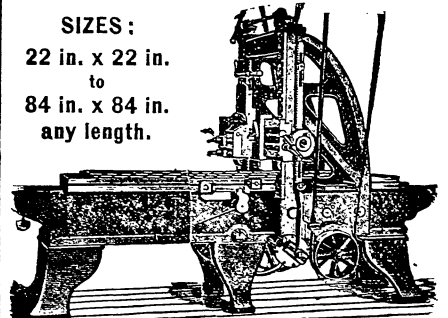


Improved Iron Planers a specialty. 20 x 20, 22 x 22,  
24 x 24 up to 42 x 42, to plane any length. Send for  
description and price-list before purchasing. Manu-  
facturers' agent for other tools and machinery. Men-  
tion *The Iron Age*.

## THE POWELL PLANER CO.

SIZES:

22 in. x 22 in.  
to  
84 in. x 84 in.  
any length.



WORCESTER, MASS.

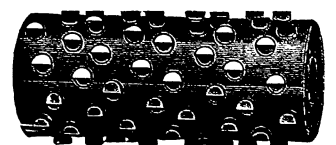
**Ingersoll Milling Machine Co.,**

Rockford, Ill.

## SLAB MILLING MACHINES

UP TO 36 IN. SQUARE, WEIGHING 22,000 LBS.

Milling  
Cutters  
of any  
Shape.



PATENTED DEC. 24, 1889.

## PITTSBURGH MFG. CO.,

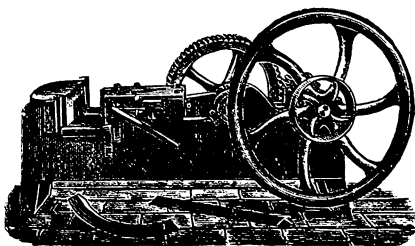
Manufacturers of

**Crosgrove's Patent Straight-  
ening, Bending and Punch-  
ing Machines.**

**NAIL MACHINERY.**

Bolts, Nuts, Rivets, Castings, &c.

PITTSBURGH - - PA.

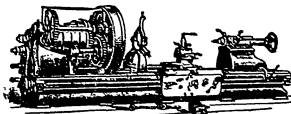


## FITCHBURG MACHINE WORKS,

MANUFACTURERS OF THE CELEBRATED

**FITCHBURG**

AND OTHER



**ENGINE LATHE**

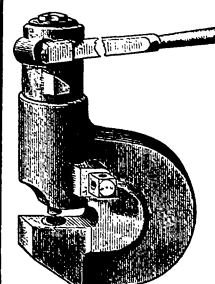
METAL-WORKING MACHINES.

**FITCHBURG  
MASS.**

SEND FOR  
CATALOGUE B.

48-inch Engine Lathe.

**PATENT RAW HIDE BOUND MALLETS & CHISEL HANDLES**  
POSITIVELY WILL NOT SPLIT  
**PATENT RAW HIDE PINIONS**  
ESPECIALLY ADAPTED TO HIGH SPEED MACHINERY. NOISELESS.  
MORE DURABLE THAN METAL. NO LUBRICANT REQUIRED.  
**NEW PROCESS RAW HIDE CO.** SYRACUSE N.Y. U.S.A.  
PATENTEES & SOLE MANUFACTURERS



**A. L. HENDERER,**  
Wilmington, Del.,

Manufacturer of  
**Hydraulic**

**Punches,**

**Screw Punches,**

Forged Steel Expand-  
ers, Flue Hole Cutters,  
Boiler Test Pumps and  
Pipe Vises.

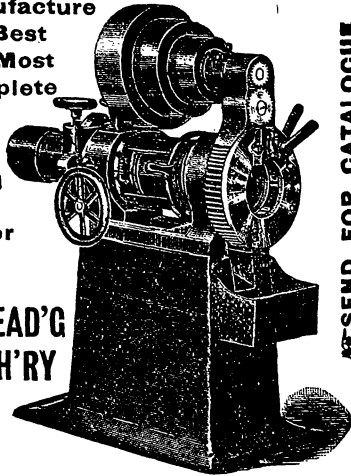
Price-lists and discounts  
on application.

The Merrill Manufacturing Co.,  
TOLEDO, O.

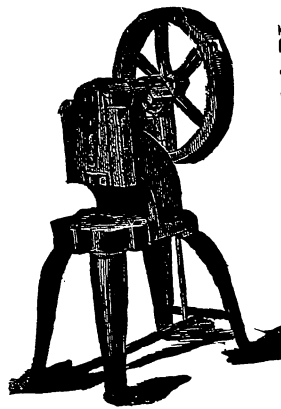
Manufacture  
The Best  
and Most  
Complete  
Line  
of

Hand  
and  
Power

PIPE  
THREAD'G  
MACH'RY  
IN  
USE.

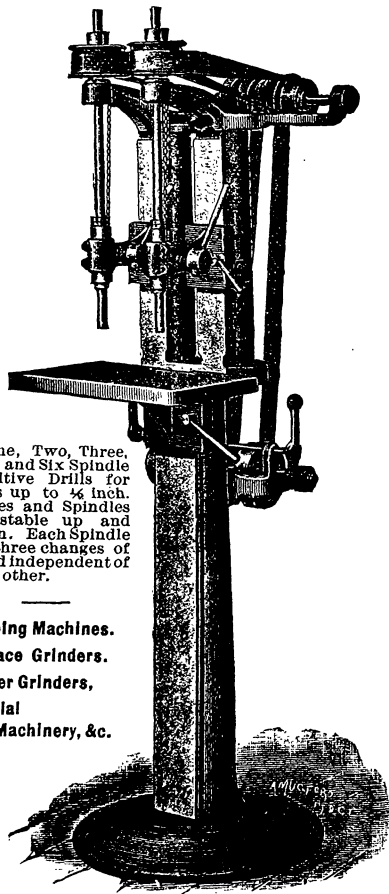


SEND FOR CATALOGUE



A. H. MERRIMAN,  
MERRIDEN, CONN.,  
Manufacturer of all Descriptions of  
**PRESSES.**

Woodward & Rogers,  
HARTFORD, CONN.

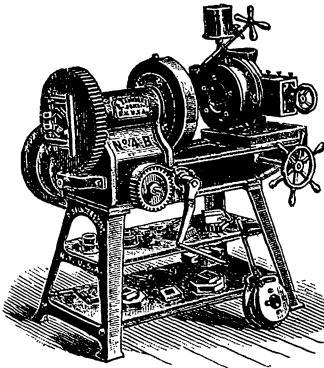


One, Two, Three,  
Four and Six Spindle  
Sensitive Drills for  
holes up to 3/4 inch.  
Tables and Spindles  
adjustable up and  
down. Each Spindle  
has three changes of  
speed independent of  
each other.

Tapping Machines.  
Surface Grinders.  
Cutter Grinders,  
Special  
Machinery, &c.

**D. SAUNDERS' SONS,**

MANUFACTURERS OF



**PIPE Cutting AND Threading MACHINES**

All sizes 1/4 inch to 16 inch for Pipe Mill,  
Gas and Steam Fitters' use. Tapping  
Machines for steam-fittings, also

**STEAM and GAS FITTERS' HAND TOOLS.**  
SEND FOR CATALOGUE.

No. 4 B Machine, 1 to 4 inch.  
Hand or Power.

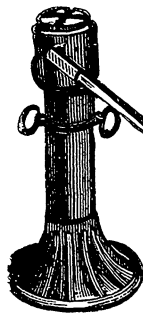
No. 25 Atherton St., Yonkers, N. Y.

**RICHARD DUDGEON,**

No. 24 Columbia Street, New York.

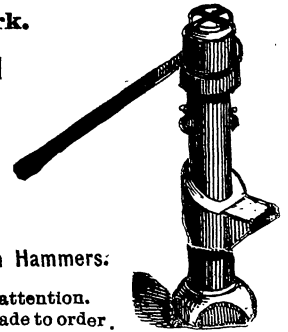
Maker and Patentee of the Improved

**Hydraulic Jacks**  
AND  
**Punches.**



Roller Tube Expanders and Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.  
Jacks for pressing on Car Wheels or Crank Pins made to order.



**HYDRAULIC JACKS.**

All sizes. All styles. All warranted.

**HYDRAULIC PRESSES,**

PUMPS, ACCUMULATORS, VALVES, GAUGES, FITTINGS, &c.

WATSON & STILLMAN,

204-210 E. 43d St., New York

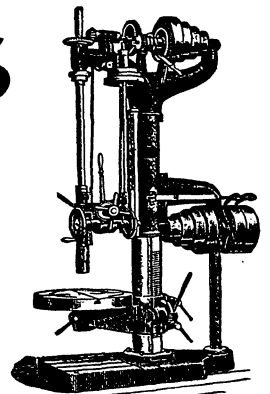
**Our Loss**

is your gain. If you need a Drill Press any  
size, either now or in the near future, we  
advise you to write for prices immediately.  
Superior tools at extremely low prices.  
Address

**THE HAMILTON MACHINE TOOL COMPANY,**

WEST MARKET STREET,

Hamilton, - Ohio, U. S. A.



**Jack Chain Machines.**

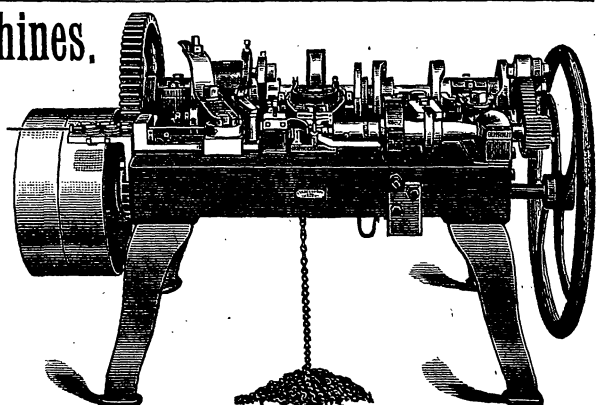
FOR BOTH DOUBLE AND  
SINGLE LINKS.

Entirely automatic,  
taking the wire directly  
from the coil and com-  
pleting chain at the rate  
of 120 links per minute.

Send for prices.

**CROSS & SPIERS MACHINE  
CO.**

Waterbury, Conn.



## A New Screw Plate. THE FULL MOUNTED LIGHTNING

These plates have a stock with each die. The dies are our celebrated adjustable Lightning dies. Each stock is of correct length and weight to suit size of die. Several sizes of dies may be in use out of the same set at the same time. Send for catalogue.



Made by WILEY & RUSSELL MFG. CO., Greenfield, Mass., U. S. A. Send for new catalogue.

# Don't Buy

## \*Maule's "Skeleton" Pipe Die

### If You Wish to Avoid

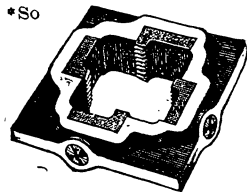
A Pipe-Threading Die extremely easy of operation by reason of the proper clearance of its cutters;

Of surpassing durability secured by the accurate and uniform temper of said Cutters;

Having Cutters that when dull may be removed in a moment, and sharpened on a grindstone or emery wheel;

Of phenomenal cheapness, arising from small first cost coupled to excellence of quality.

*If by chance you do not think these points, or the saving of money, objectionable,*

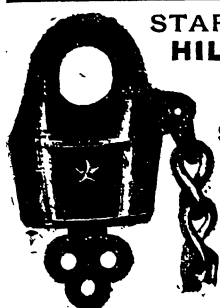


Send us a Postal Note for 62 Cents (do not send us any postage stamps), and we will mail you a sample one-inch Die, either  $2\frac{3}{8}$  or  $2\frac{1}{2} \times \frac{3}{4}$  thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,  
PHILADELPHIA, U. S. A.

Send for Catalogue of the "Skeleton" Pipe Die.

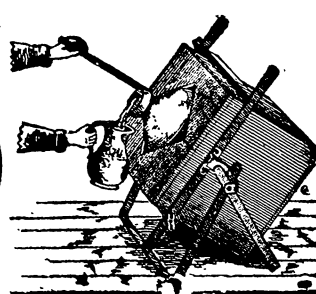
Wire Drawing Machines, **WATERBURY**  
Gang Slitters,  
Power Presses and Dies, **MACHINE CO.**,  
Tumbling Barrels, Waterbury, Conn.  
Special Machinery. **MANUFACTURERS.**  
Send For Prices.



STAR LOCK WORKS, PHILA  
HILLEBRAND & WOLF,  
Manuf'rs of

1st QUALITY ONLY  
SCANDINAVIAN  
AND  
SPRING PADLOCKS  
Trunk & Case  
Locks, Carboy  
Stands, &c.

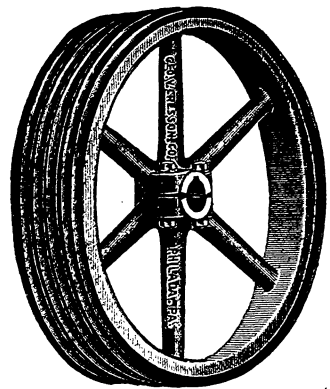
CATALOGUES SENT ON APPLICATION.



## GEO. V. CRESSON CO.,

18th STREET AND ALLEGHENY AVE.

PHILADELPHIA, PA.



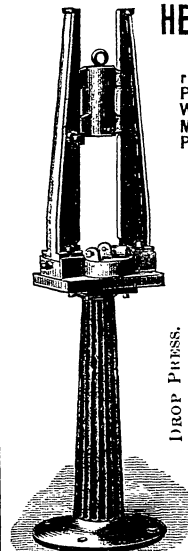
## ROPE WHEELS,

All Diameters and Number of Grooves, for Manilla, Hemp, Cotton, or Leather Ropes.

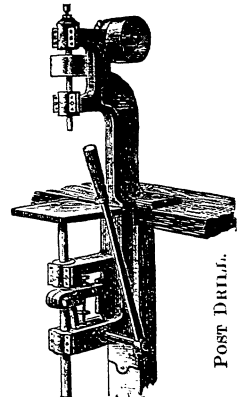
## HERRICK & COWELL,

Manufacturers,

Mill Presses, Paper Box, Buffing Polishing, Electrotypes, Emery Wheel Machinery, and Special Machinery. Power and Foot Presses.



DROP PRESS.

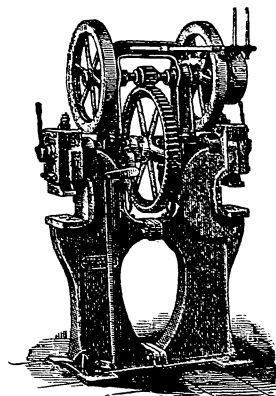


POST DRILL.

Send for Catalogue.

NEW HAVEN, CONN.

THE LONG & ALLSTATTER CO.,  
HAMILTON, O.



PUNCHES, SHEARS  
AND HAMMERS.

Double, Single, Horizontal, Twin-Boiler, Spacing Gate, Multiple Angle Bar, &c. Belt and Steam Driven.

SEND FOR CATALOGUE.

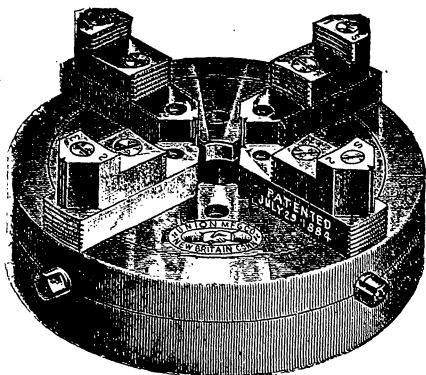
Electric Traction on Railways and Tramways. By A. BEERENZAUN. The author has endeavored in this book to summarize as concisely as possible the present state of electric traction and to describe the various methods and constructive details which are to-day in use or which have marked consecutive steps in the development of the art. 218 illustrations, 12mo, cloth, \$4.00.

For sale by David Williams, 96-102 Read St., N. Y.

# UNION MANUFACTURING COMPANY, NEW BRITAIN, CONN.

WAREHOUSE, 103 CHAMBERS ST., NEW YORK.

Manufacturers of Combination Chucks, Universal Chucks, Independent Chucks, Combination Reversible Jaw Chucks, Car Wheel Chucks, &c., &c.



## Union Chuck No. 21.

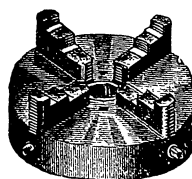
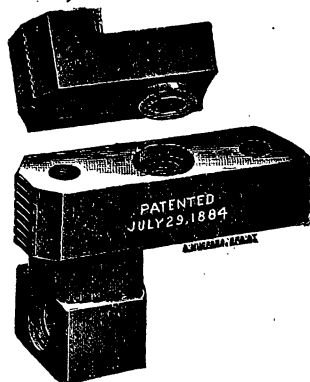
Combination with Reversible Jaws.

ALSO

Showing Sectional Cut of Jaw.

We guarantee our Chucks in every particular.

WRITE FOR CATALOGUE AND PRICE-LIST,



## SKINNER CHUCKS.

Independent and Universal Chucks, Combination Lathe Chucks with patent reversible jaws, Drill Chucks, Planer Chucks and Face Plate Jaws.

SKINNER CHUCK CO.,

New Britain, Conn.

SEND FOR CATALOGUE.

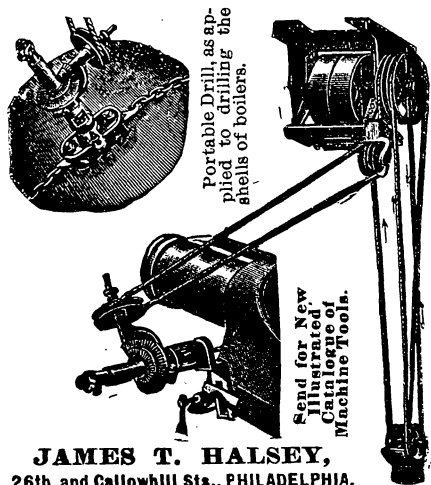
## FRICTION CLUTCHES, SHAFTING, HANGERS, PULLEYS.

Sheaves for Rope Driving.  
Gear Wheels.

FRICTION PULLEYS.

## KEYSTONE CLUTCH AND MACHINE WORKS,

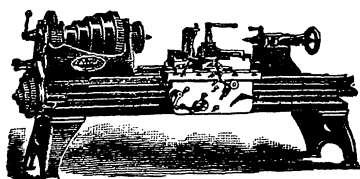
1708-1710 Germantown Ave.,  
PHILADELPHIA, PA.



Portable Drill, as applied to drilling the shells of boilers.

Send for New Illustrated Catalogue of Machine Tools.

JAMES T. HALSEY,  
26th and Callowhill Sts., PHILADELPHIA.



NEW HAVEN MANUFACTURING CO.  
NEW HAVEN, CONN.

Manufacturers of

## IRON-WORKING MACHINERY

Planers, Shapers, Drills, Slotters, Etc.

## 'CUSHMAN' CHUCKS.

We manufacture and keep in stock a full line of chucks for all purposes

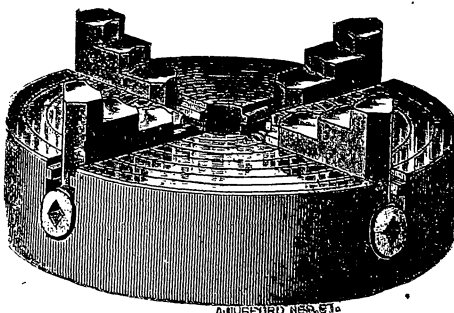
Independent 4 Jaw Chucks from 4 to 26 Inch.  
Patent 4 Jaw Lathe Chucks from 4 to 26 Inch.  
Reversible Face-Plate Jaws for Use on Lathes from 30 to 72 Inch.  
Two-Jaw Chucks, Round and Box Body, from 4 1/2 to 18 Inch.  
Universal Chucks from 2 to 21 Inch, in several styles.  
Combination Chucks from 4 to 24 Inch.  
Drill Chucks, four styles.  
Centering Chucks.  
Special Chucks for Cutting-off Machines. A full line and some new improvements.

We also make a great variety of special Chucks for holding bicycle parts, valves, fittings and other special shaped pieces.

A 44-Page Catalogue Sent on Application.

**THE CUSHMAN CHUCK CO.,**  
Hartford, Conn.

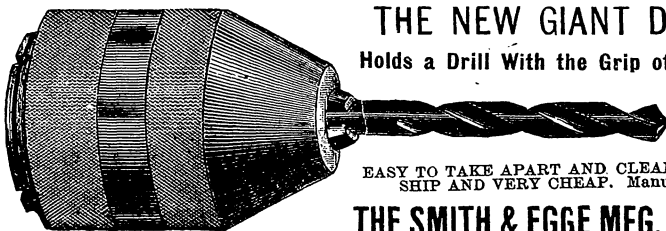
## CHAMPION INDEPENDENT CHUCKS.



An entirely new line of small Chucks, provided with 3 or 4 independent reversible steel jaws. The best Chuck in the market for foot lathes. Ask your dealer for them or write to us.

**THE D. E. WHITON MACHINE CO.**  
New London, Conn.

Sole European Agents SELIG SONNENTHAL & CO., London.



## THE NEW GIANT DRILL CHUCK.

Holds a Drill With the Grip of a Giant. All Steel Parts Interchangeable. SIMPLE IN CONSTRUCTION.

EASY TO TAKE APART AND CLEAN. BEST OF WORKMANSHIP AND VERY CHEAP. Manufactured and sold by

**THE SMITH & EGGE MFG. CO.,** Bridgeport, Conn

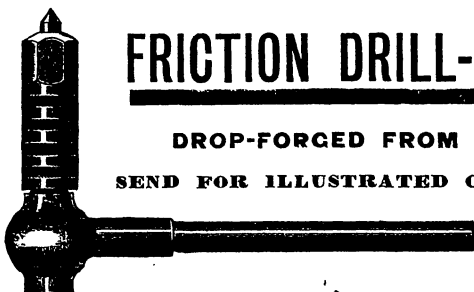
## INSTANTANEOUS CLUTCH.

## NO LOST MOTION.

MADE

FOR

SERVICE.



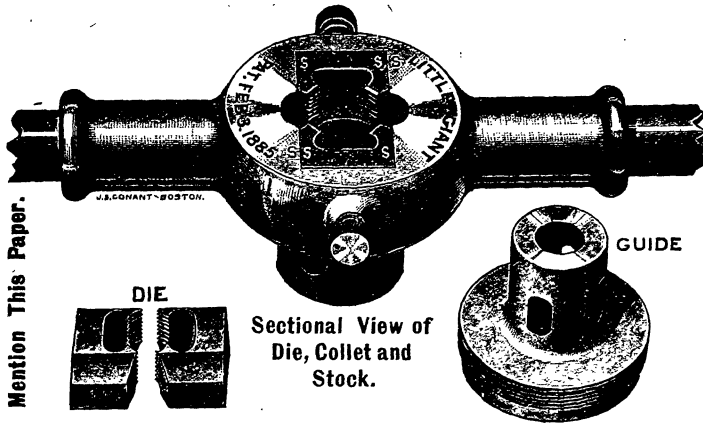
## FRICTION DRILL-STOCK,

DROP-FORGED FROM STEEL.

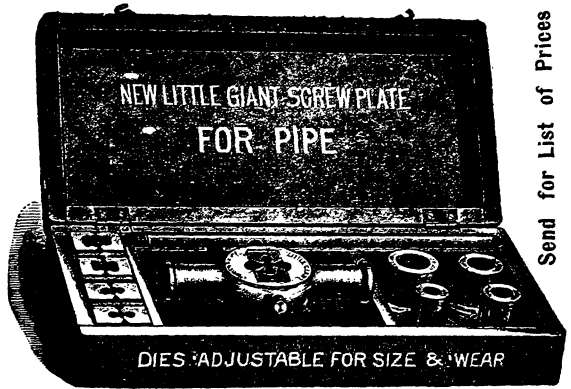
SEND FOR ILLUSTRATED CATALOGUE.

**Smith Friction Drill & Tool Co., BOSTON, MASS.**

# NEW LITTLE GIANT ADJUSTABLE DIE SCREW PLATE FOR PIPE.



SEND FOR CATALOGUE



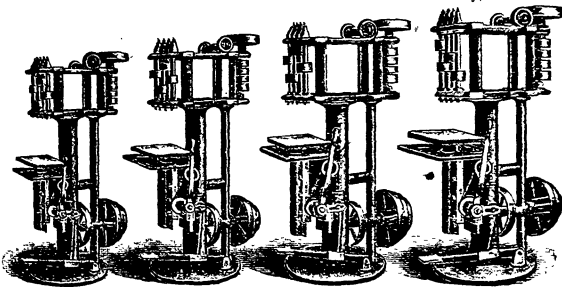
Send for List of Prices

To change from one size to another, simply screw out the guide, drop out the die, and replace with -size die and guide required.

**PRACTICAL, SIMPLE AND DURABLE.**

MANUFACTURED BY  
**WELLS BROS. & CO.,**  
Greenfield, Mass., U. S. A.

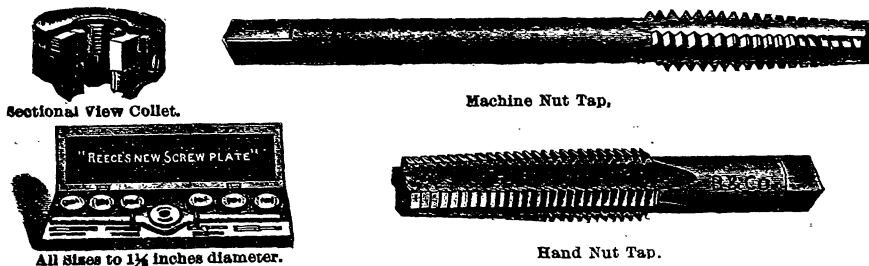
## PRATT & WHITNEY CO., Hartford, Conn., U. S. A.



Manufacture Gang Drills of improved design, with two, three, four and six spindles, in four sizes. The spindles are made of tool steel, have steel boxes hardened and ground, with provision for adjustment for wear. Tables are counterbalanced.

**Drilling Machines of many styles in Stock.**

ASK FOR "HARDWARE" CATALOGUE.



**BUTTERFIELD & CO., Derby Line, Vt.,**  
Manufacturers of SCREW-CUTTING TOOLS In Great Variety.  
WRITE FOR ILLUSTRATED CATALOGUE.

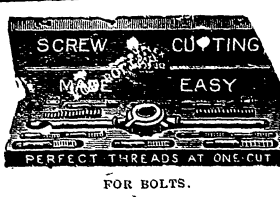


Three styles of Screw Plates **BUILT ENTIRELY ON HONOR**, with prices to suit all.  
Write for catalogue.

**CHAMPION BLOWER & FORGE CO., - - LANCASTER, PA.**



THE ADJUSTABLE  
**"DUPLEX" DIE STOCK.**  
Quick. Accurate. Durable.  
15,000 now in use.  
**HART MANUFACTURING CO.,**  
CLEVELAND, O., U. S. A.



**Portable Drilling Machines**  
Manufactured by  
**ALBERT M. COLBURN,**  
Wall St., New Haven, Conn.  
SEND FOR CATALOGUE.

**REECE'S PATENT HAND BOLT CUTTER OR SCREW PLATE.**



Send for new catalogue of  
**SCREW CUTTING TOOLS.**  
**EDWARD F. REECE, Mnfr., GREENFIELD, MASS.**

**GEORGE E. BELL,**  
Successor to E. M. HYDE and UNION STONE CO.,  
—SOLE AGENT—  
**Waltham Emery Wheels,**  
**WALPOLE MILLS TURKISH EMERY.**  
Dealer in Platers' and Polishers' Machinery and Supplies of all kinds. Foundry Supplies.  
36 JOHN ST., NEW YORK.

**DRILL GRINDER.**



**THE WASHBURN SHOPS,**  
**WORCESTER, MASS.**



# THE STANDARD TOOL CO., CLEVELAND, OHIO.

MANUFACTURERS OF

Increase: Twist Drills, Reamers, Taps, Milling Cutters and Chucks.

Taper Shank  
Drills,  
St. Shank Drills,  
Screw-driver  
Bits,  
Reamers,  
Shell and Solid  
Taper Reamers.



Bit Stock Drills for Metal or Wood.



Wood-Boring Brace Drills, will cut off nails.

Hand Taps,  
Mach. Screw Taps  
"Standard" Drill  
Chuck,  
"Ellenwood" Drill  
Chuck,  
Sq. Shank Drills  
for Ratchets,  
Twist Drills for  
Blacksmiths'  
Presses

Sockets for  
Taper Shank  
Drills.Reamers in  
all sizes.

NEW YORK OFFICE, 33 CHAMBERS ST. Send for Catalogue.

1874

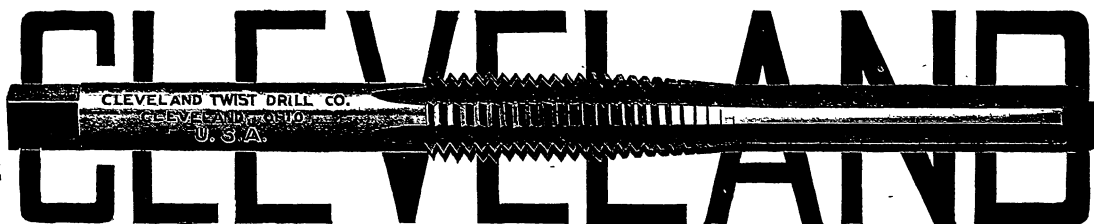
OLD RELIABLE.

1893

SEND

FOR

CATALOGUE



WRITE

FOR

DISCOUNTS

Our Drills are Hot Forged. The best part of the steel IS NOT CUT OUT and thrown away.



They are TOUGHER, STRONGER, BETTER than is possible to attain by milling. Catalogue and Discounts sent on application.

## STOW FLEXIBLE SHAFT,

Invented and  
Manufactured by  
**THE**

STOW MFG. CO.,

Established 1875. Binghamton,  
N. Y.

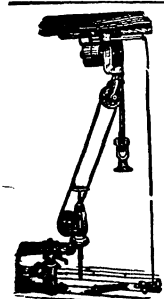
**PORTABLE.**  
DRILLING  
TAPPING.  
REAMING.

General European Agents,

SELIG SONNENTHAL &amp; CO.,

85 Queen Victoria St.,

LONDON, ENGLAND.



Thos. H. Dallett &amp; Co.

York St. and Sedgley Ave.,  
PHILA.

MANUFACTURERS OF  
Portable Drills, Hand  
Drills, Boiler Shell Drills  
Electric Motors specially  
adapted for driving Ma-  
chine Tools, Cranes, Ele-  
vators, Pumps, Presses and  
other machinery.

Complete Power and Light  
Plants Installed.

## Stow Flexible Shaft Co., Limited,

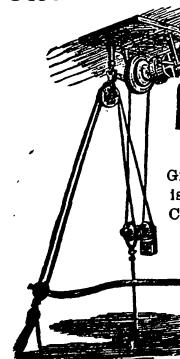
26th, Callowhill & Biddle Sts.  
PHILA., PA.,

Manufacturers of  
**PORTABLE DRILLING,**  
TAPPING, REAMING  
and BORING MACHINES

Also Tools for Emery Wheel  
Grinding, Metal and Wood Pol-  
ishing, Cattle Brushing and  
Clipping, &c.

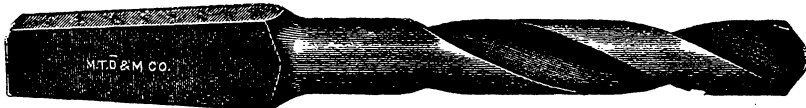
Gen'l European  
Agents.

Bolling & Lowe,  
2 Lawrence,  
Pountney Hill.  
LONDON, ENG.



## Morse Twist Drill & Machine Co., NEW BEDFORD, MASS.

Manufacturers of Morse Pat. Straight-Lip Increase Twist Drills,



Bit Stock Drills, Solid and Shell Reamers, Drill Grinding Machines.

Milling



Cutters,

Beach's Patent Self-Centering Chucks, and Special Tools to Order.



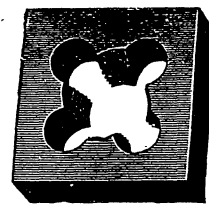
ALL TOOLS EXACT TO WHITWORTH STANDARD GAUGES.

## MANNING, MAXWELL & MOORE,

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S



Manufacture of Patent Machine Relieved Nut, Hand,  
Blacksmith and Machine Screw Taps, Screw Plates, Tap  
Wrenches and Patent Relieved Pipe Taps and  
Pipe Reamers; also of Solid Bolt and Pipe  
Dies. Furnished in V, U, S. Standard and  
Whitworth shape of threads.



111 Liberty Street,

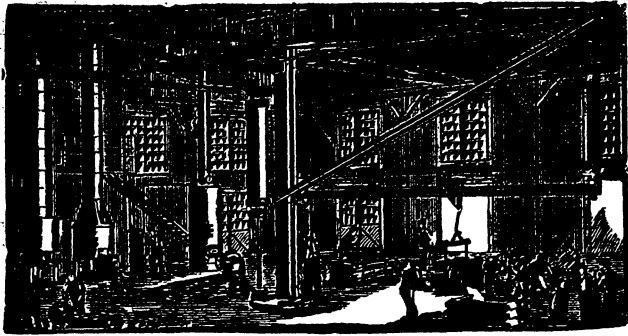
NEW YORK.

## SOMETHING NEW.

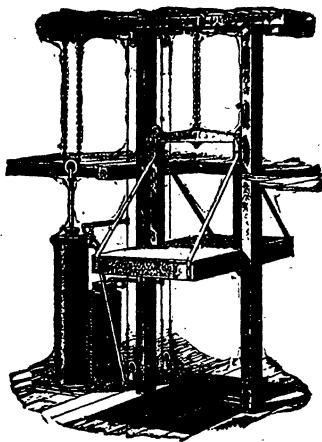
If you are a sportsman read this ad. or send for an illustrated list of **THE NEW EUREKA CLEANING SET**, which we have added to our list of gun cleaning tools. The No. 164 Gun Cleaning Set is considered by sportsmen who have it to be the most useful set of tools ever put up for cleaning a gun.

It contains the following implements: Madeira Cleaning Rod, Bristle Brush, Flannel Wiper Scratch Brush, bottle of Belmont's Oil, Screw Driver, Oil Can and Tube of Paravaseline. Made in 10, 12, 14, 16 and 20 ga. Sample sent on receipt of \$1.25. Ask your dealer to show you this set.

THE BRIDGEPORT GUN IMPLEMENT CO., New York.



5-ton Ridgway Crane in Foundry Diamond State Iron Co., Wilmington, Del.



Steam-Hydraulic Elevator.

is the Crane for all places.

Give full particulars and get circulars and prices.

**SAFE,  
RAPID,  
SURE**  
— AND —  
**Not Costly.**

The Crane that is perfection for the exacting requirements of a Foundry

**CRAIG RIDGWAY & SON.,**  
**Coatesville, Pa.**

## Ridgway Balanced Steam-Hydraulic Crane.

The Greatest Foundry Crane Known.

**READ!**

Have Dozens More Like It.

THE STIRLING COMPANY,  
Water Tube Boilers.

Barberton, Ohio, April, 10, 1893.

MESSRS. CRAIG RIDGWAY &amp; SON, Coatesville, Pa.

Gentlemen:—Some fifteen months ago my attention was called to the Crane you were building at Coatesville, and having had a large experience in the manufacture of the ordinary Hydraulic Cranes and the erection of Bessemer and Open Hearth Steel Plants, I concluded to give your Crane a thorough investigation, which I did. Six months ago we decided to build a foundry, and after looking over the various cranes in the market and satisfying ourselves we placed our order with you for one of your five-ton Steam-Hydraulic Cranes.

We have had this Crane in operation for the past two months and take pleasure in saying to you that it has more than filled all the requirements. The Crane is so simple in construction and design that it is operated by a small boy and is absolutely under control at all times. The uncovering of flasks, where it is necessary that the movement of the crane should be very slow and regular, is perfect. The coping of flasks, where it is necessary to lower the flasks carefully without jar, is done in the same manner. The cost of maintenance is nothing, and the cost of furnishing power is about the same. The small quantity of steam used is not missed on our boiler. Our fuel consumption is practically the same as it was before the Crane was put in and we are using it continually 12 hours per day. Our Secretary and General Manager was here on Friday of last week and spent five or six hours in the Foundry watching the manipulation and operation of the Crane, and as he is thoroughly familiar with all the cranes made in this country he expressed himself in this manner: "The money invested in the Ridgway Crane is one of the best investments the Stirling Company has ever made," and I concluded to write you and let you know how thoroughly well pleased and satisfied we are with our purchase.

Yours truly, THE STIRLING COMPANY.

H. E. Pell, Supt.

NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUB

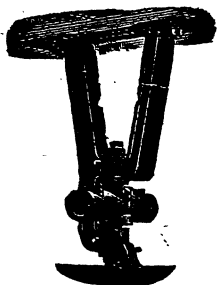
**BONNELLS NUBIAN**We Have It  
You want It.**MONEY**You Have It  
We Want It:

And for your money we will give you the best black on earth. Every gallon guaranteed. Far superior to asphaltum and just as cheap.

77 Warren St., New York, N. Y.  
Hall & Carpenter, Philadelphia.  
Taylor Goodrich, San Francisco.**THE NUBIAN IRON ENAMEL CO.,**33-35 Nubian Ave.,  
CRAGIN, ILL.

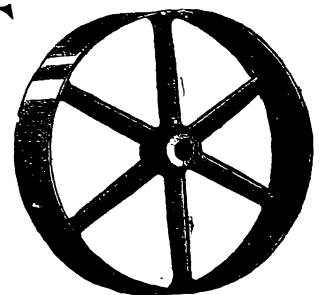
NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUBIAN BONNELL'S NUB

## THE MONTHS PAST



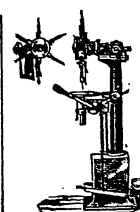
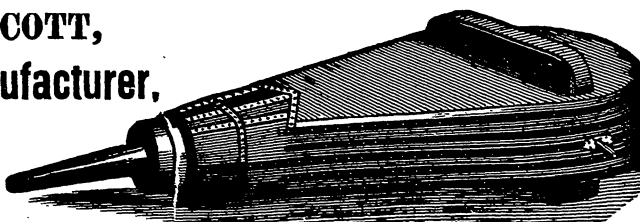
have taught many a manufacturer to economize while making repairs in the shop. There are no better products in the world to do this with than our Pulleys, Hangers, Journal Boxes, Wall Brackets, etc. Try them.

J W. FOLEY &amp; CO., 329-337 W. Front Street, Cincinnati, O.



**GEO. M. SCOTT,**  
**Bellows Manufacturer,**

Johnson Street  
Cor. 22d St.,  
CHICAGO ILL.

**QUINT'S TURRET DRILLS.**

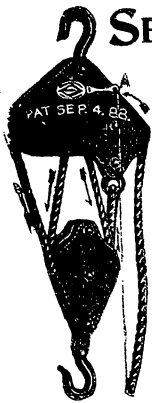
Six Spindle.

Drills from 1-32 to 1/4 hole. Speed from 250 to 2000 rev.

Suitable for a large variety of work and is operated with ease and rapidity.

SEND FOR CIRCULAR.

A. D. QUINT, Hartford, Conn.



**SELL THE BEST.**

**THE "SURE GRIP"  
Steel Tackle Block**

is taking the place of all other hoisting blocks.

Send for catalogue and discount

**Fulton Iron & Engine Works,**  
28 Brush St., Detroit, Mich.  
ESTABLISHED 1852.



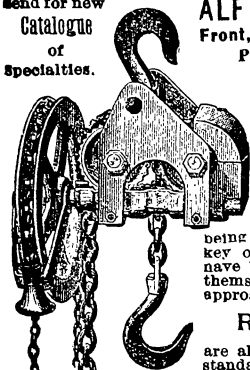
**Highest Efficiency.**

**WESTON'S NEW  
TRIPLEX  
Chain Block**

far exceeds all predecessors. Send for Prof. Thurston's report of comparative tests of all chain pulley blocks.

**The Yale & Towne Mfg. Co.**  
STAMFORD, CONN.  
New York, 34-36 Chambers St.  
Chicago, 152-154 Wabash Ave.  
Philadelphia, 1120 Market St.  
Boston, 224 Franklin St.

Send for new  
Catalogue  
of  
Specialties.



**ALFRED BOX CO**  
Front, Poplar and Canal Sts.  
Philadelphia, Pa.

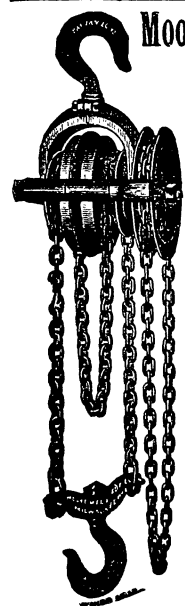
Manufacturers of  
Box's Pat. Double

**Screw Hoists**  
13,000 in use.

Many have done hard continuous duty 5 years without a single part being renewed. This is the key of our success. They have built up a reputation themselves that cannot be approached. Our improved

**Radial Drills**

are also assuming the same standard.



**Moore Mfg. & Fdry. Co.,**

Milwaukee, Wis., U. S. A.,  
Manufacturers of  
Moore's Anti-Friction

**Differential  
Chain**

**Pulley  
Block.**

A New Movement!  
A Perpetual Com-  
pound Lever!  
Powerful, Simple and  
Durable!  
One Man Can Lift to  
the Full Capacity of the  
Block.  
Self-Sustaining at Any  
Point.  
The Block Always  
Hangs Plumb.

Send for descriptive price-list,  
mentioning this paper.

**Salem Foundry and Machine Shop**

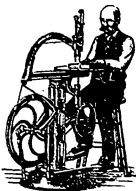
BUILDERS OF

**ELEVATORS**

SALEM, MASS.

# LATHES.

**ISRAEL H. JOHNSON, JR., & CO., - PHILADELPHIA.**

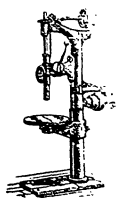
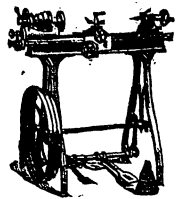


**Patent Foot Power Machinery**

SCROLL SAWS, CIRCULAR SAWS,  
MORTISERS, LATHES, &c

For Carpenters, Builders, Cabinet Makers and all Wood and  
Metal Workers. Catalogue free.

**SENECA FALLS MFG. CO.,**  
255 Water St., Seneca Falls, N. Y.



**UPRIGHT  
FULL UNIVERSAL  
AND RADIAL  
BORING AND TURNING MILLS.**

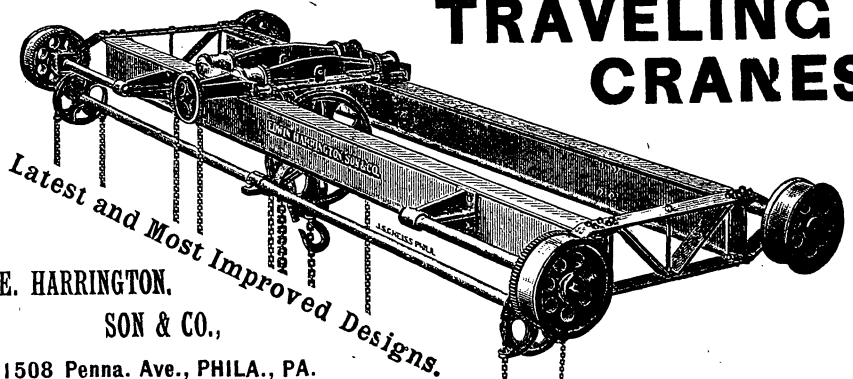
**BICKFORD DRILL AND TOOL CO.,**  
10 Lawrence St., Cincinnati, O.

# DRILLS

**COPELAND & BACON**  
HOISTING & WINDING ENGINES

ORE CRUSHERS,  
ORE WASHERS,  
CONCENTRATING  
MACHINERY,  
GRAVITY INCLINES,  
STONE CRUSHERS,  
RAILROAD CRANES.

85 LIBERTY ST. NEW YORK. 62 SO. CANAL ST. CHICAGO.

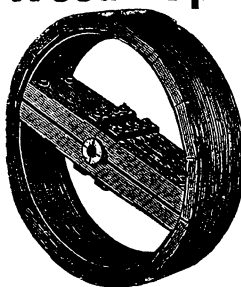


## TRAVELING CRANES

Latest and Most Improved Designs.  
**E. HARRINGTON,  
SON & CO.,**  
1508 Penna. Ave., PHILA., PA.

**Wood Split Pulley.**

Strongest,  
Lightest,  
Simplest,  
Cheapest.



**REEDS PULLEY CO.,**  
1220 E. 7th Street, COLUMBUS, IND.  
New York Agents,  
Patterson, Gottfried & Hunter, 146-150 Centre St.

**EXPERIMENTAL ELECTRICITY.**

By EDWARD THEVERT.

Illustrated. - Cloth. - \$1.00.

CONTENTS—Some Easy Experiments in  
Electricity and Magnetism; How to Make  
Electric Batteries; A Galvanometer; An  
Induction Coil; An Electric Bell; A  
Magneto Machine; A Telegraph Instru-  
ment; An Electric Motor; A Dynamo;  
Electric Bell Fitting and Gas Lighting;  
Electric Lamps; Electric Terms.

**DAVID WILLIAMS, Publisher & Bookseller,**  
96-102 Reane St., New York.



*William Sellers & Co., Incorp.*

PHILADELPHIA, PA.,

—MANUFACTURERS OF—

Improved Machine Tools for Working Iron and Steel,  
High Speed Power Traveling and Swing Cranes,  
Injectors, Locomotive Turn Tables, Shafting, &c., &c.  
Testing Machines, under patents of A. H. Emery.  
Prices, Descriptive Matter, &c., Furnished on Application.



**MORSE,  
WILLIAMS  
& CO.**

Morse Elevator Works.

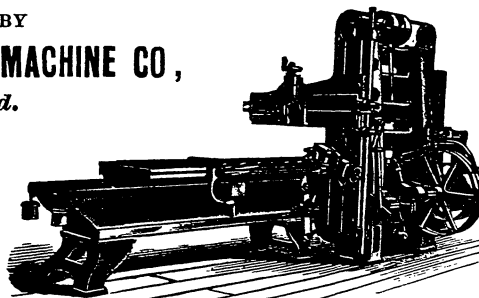
MANUFACTURERS AND BUILDERS OF  
ELECTRIC, HYDRAULIC, BELT and HAND  
POWER PASSENGER and FREIGHT  
**ELEVATORS.**

1205 Frankford Ave., Philadelphia. 108 Liberty St., New York  
1206 E. St., N. W., Washington, D.C. 33 Lincoln St., Boston.  
425 Spruce St., Scranton, Pa. 82 Church St., New Haven  
Omaha Building, Chicago, Ill.

WHEN YOU GO TO THE WORLD'S FAIR EXAMINE THE  
**OPEN-SIDE PLANERS**

MANUFACTURED BY  
**THE DETRICK & HARVEY MACHINE CO.,**  
Baltimore, Md.

Which may be seen in operation in  
MACHINERY HALL,  
Section 13, Column J 41.



**FAIRMOUNT MACHINE CO.,**  
(Successors to Thomas Wood & Co.)

Twenty-second and Wood Sts., Philadelphia, Pa.  
Shafting, Gearing, Self-Oiling Bearings, Friction Pul-  
leys, Elevators.

Rope Transmission; Sheave Wheels, any size required, for Hemp, Manila and Cot-  
ton Rope Driving. Looms, Cotton and Woolen Machinery for Winding,  
Spooling, Reeling, Beaming, Warping, Dyeing, Sizing, Scouring &c.

Tinners'

Roofers'

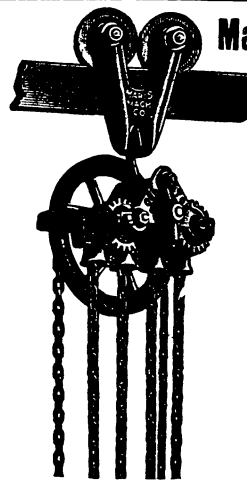
**NIAGARA TOOLS.**

Presses,

Shears,

Dies.

NIAGARA STAMPING AND TOOL CO., Buffalo, N. Y.



**Maris & Beekley,**  
PHILA., PA.  
MANUFACTURERS OF  
**CRANES,**

Power Bridge  
Cranes, Hand  
Bridge Cranes,  
Jib Cranes.

Portable Hoist,  
Holds load at any  
point.

Overhead Track,  
Trolleys,  
Switches.

World's Fair, Ma-  
chinery Hall, Section  
36, Column O-30.



**J. G. SPEIDEL,**  
807 & 809 CHERRY STREET,  
READING, PA.,  
Patentee and Manufacturer of the  
celebrated

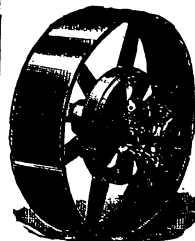
**Economic Safety Hoist.**

500 to 30,000 Lbs. Capacity.  
Has been awarded the John Scott  
Medal and Premium by the Franklin  
Institute of the City of Philadelphia  
for Highest Efficiency, Sim-  
plicity and Durability.

One man can lift two to three times  
as fast as with any other self-holding  
chain hoist. It has two speeds, is  
built strong and durable, and guaran-  
teed to give satisfaction.

TRAVELING AND SWING CRANES up  
to 30,000 lbs. capacity and 50 ft. span.  
Overhead Tramway, with Trolleys,  
Switches, &c. Elevators and  
Special Hoisting Machinery.  
Illustrated Cat. and Prices on  
application.

**The Moore & White Co.,**



Paper

Machinery,

Friction

Clutches, &c.

Clutch Pulley.

N. E. Cor. 15th AND LEHIGH AVE.,  
PHILADELPHIA, PA.

**Wanted, Contracts**

For building mining, blast furnace, rolling  
mill and factory machinery, for making cast-  
ings for cable and electric railroads, or any  
special line of castings. Address

**MAHONING FOUNDRY AND MACHINE SHOP**

Danville Pennsylvania.

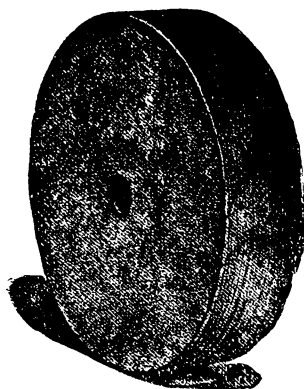


# The Norton Emery and Corundum Wheels

## Emery Wheel Machinery and Specialties.

Send for Illustrated Catalogue.

### Solid Leather Wheels FOR POLISHING.



Will outwear any other wheel.  
Saves the continual expense of  
recovering. Pliable and elastic.  
Waterproof and will not burst.

**C. E. LE MASSENA & CO.,**

776 Broad Street, NEWARK, N. J.

**A POOR OIL STONE IS WORTHLESS.**

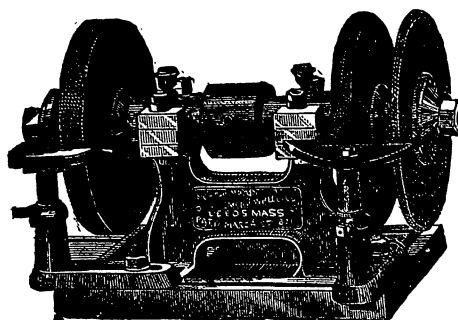
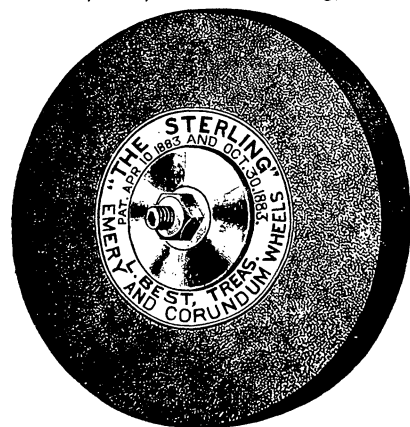


**PIKE'S**

Lily White Washita is  
Warranted to give  
satisfaction.

**THE PIKE MFG. CO., PIKE STATION, N. H.**

Sterling Emery Wheel Company, 174 Fulton St., N. Y.  
Factories:  
Tiffin, Ohio, and West Sterling, Mass.



ESTABLISHED 1867. CAPITAL \$100,000

**Northampton Emery Wheel Co.,**  
**LEEDS, MASS.**

And 20 South Canal St., Chicago,

MANUFACTURERS OF

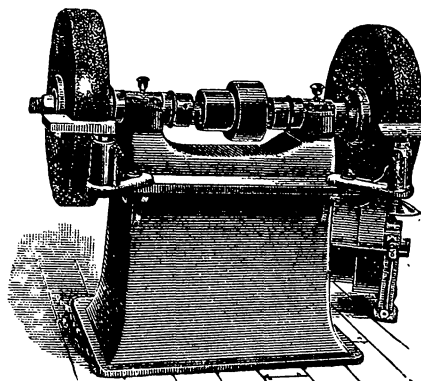
**EMERY WHEELS**

—AND—

**EMERY WHEEL MACHINERY**

*Of Best Quality.*

Send for Catalogue. FACTORY AT LEEDS, MASS



**The Springfield Emery Wheel Co.,**

**Bridgeport, Conn.**

Western Agency, 125 So. Clinton St., Chicago, Ill.

**EMERY AND CORUNDUM WHEELS,**  
**To Run WET or DRY.**

**Over 50 Different Sizes of  
Dry Grinders,**

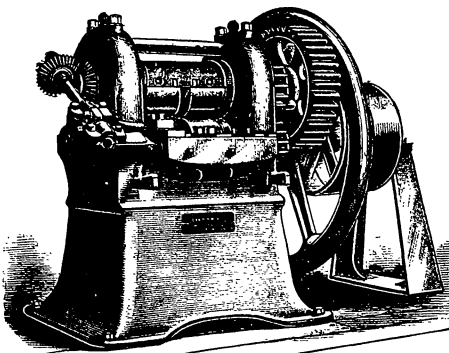
And over 200 different varieties of Emery  
Wheel Machinery. All goods guaranteed  
satisfactory.

SEND FOR CATALOGUE.

IT'S  
TO **Your Advantage**

to correspond with  
us regarding emery  
wheels.

**Grant Corundum Wheel Mfg. Co.**  
**WORCESTER, MASS.**



**Taper Rolling Machine**

For tapering round or flat stock.  
For Elliptic Springs, Round Car  
Spring Points, Files and Agricult-  
ural Work.

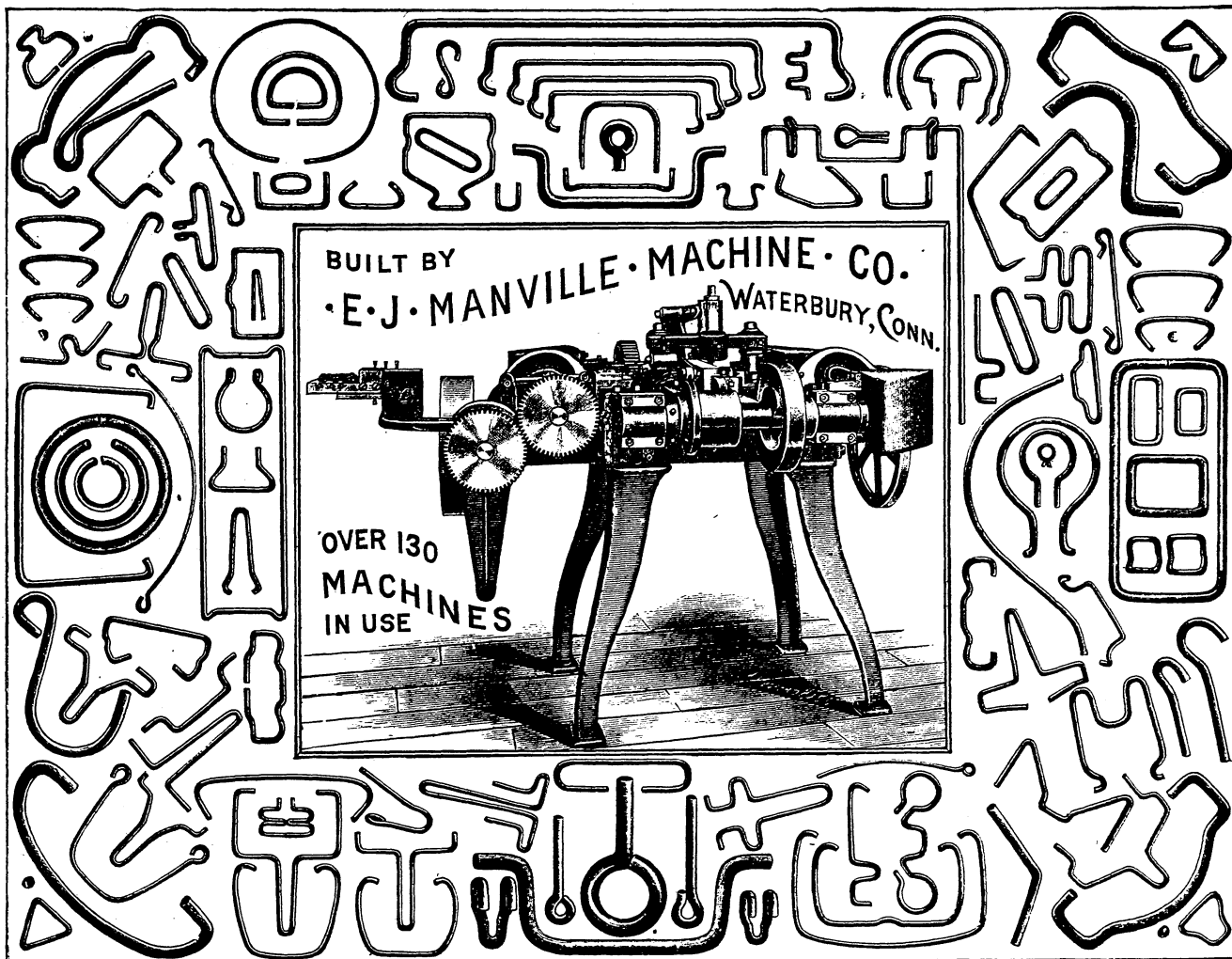
MANUFACTURED BY

**THE COULTER & McKENZIE  
MACHINE CO.,**

**Bridgeport, - - Conn.**

Also makers of Power Presses, Rivet  
Machines and fine Automatic Wire  
Working Tools.

**THE NEWEST BOOKS** on Scientific and Technical Sub-  
jects promptly supplied, on receipt of price, by **DAVID  
WILLIAMS**, Publisher and Bookseller, 96-102 Reade Street,  
New York. Send for Catalogue.



BUILT BY  
E. J. MANVILLE MACHINE CO.  
WATERBURY, CONN.

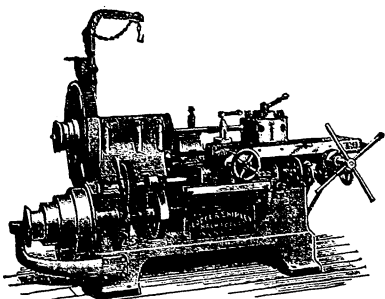
OVER 130  
MACHINES  
IN USE

# TURRET LATHES.

The Turret on saddle is an adjustable box tool. Large and long spindle.

Bed, head stock, tail stock and side rails one and the same casting. Immense power.

Especially designed for duplicating work. Absolutely rigid.



The Lodge & Shipley  
Machine Tool Co.

107-113 CULVERT STREET,

CINCINNATI, - - - OHIO

Mfrs. of machinery for rapid turning and boring.

FOR NUMBERING AND LABELING  
Boxes, Drawers and Shelves  
In Hardware Stores and Factories.

Send for sample and description of our Handy Box of small gummed Letters and Figures, intended for labeling shelf boxes. Put up especially for the Hardware trade.

THE TABLET AND TICKET CO., Mfrs.,  
87-89 Franklin St. Chicago. 99 Franklin St., New York.

**WILLSON'S  
PAPER  
LETTERS**

DUNHAM NUT MACHINE CO.,  
Unionville, Conn.,

Manufacturers of

**AUTOMATIC COLD PRESS NUT MACHINES**

FOR MAKING CHAMFERED AND TRIMMED NUTS.

Correspondence Solicited.

THE ROBERT W. HUNT & CO.

Bureau of Inspection, Tests and Consultation.

Rails, Splices and Cars. Analytical and Physical Laboratories. Examination of Iron and Steel Works and advice on Processes.

General Office: The Rookery, Chicago. Branch Offices: Hamilton Building, Pittsburgh; 28 Chestnut St., Philadelphia; 80 Broadway New York.



The Scattergood  
Time Record and  
Pay Roll Book.  
(Pat. Oct. 13, 1891.)  
Address for Circular to  
HENRY W. SCATTERGOOD,  
23 Richmond St., Phila., Pa.

**The Best On Earth.**

THAT IS WHAT THEY ALL SAY OF  
**BEREA GRINDSTONE**

Of which we are the sole manufacturers.

Send for prices and our Catalogue C, showing Mounted Grindstones, Scythe Stones, &c.

**The Cleveland Stone Co.,  
CLEVELAND, O.**





# Great Bargains. Snaps in Tools.

**Must be Sold and Removed.**

16 in. x 30 in. Horizontal Engine.  
18 in. x 36 in. Horizontal Engine.  
24 in. x 36 in. Horizontal Engine.  
19½ in. x 48 in. Beam Engine, with Knowles Condenser.

Write us for what you want.

**LOVEGROVE & CO.,**

Third and Quarry Sts., Philadelphia, Pa.

## SECOND-HAND MACHINERY.

One Belden 100-lb. Upright Power Hammer.  
One American Tool Co.'s No. 2 Cabinet Turret Lathe, with slide rest; in fine order.  
One Pratt & Whitney 36-in. Gap Chucking Lathe.  
One Pratt & Whitney No. 3 Lincoln Milling Machine.  
One Iron Planer, 52 in. wide, 44 in. high, 12 ft. long, with two heads.  
One Springfield Universal Grinding Machine No. 3, swing 18½ in. over the ways and take 6 ft. between centers. Has been used but a very few times and is practically new.  
Send for circular of Second-hand Machinery in stock.

**HILL, CLARKE & CO.,**  
156 Oliver St., Boston, Mass.  
12 and 14 South Canal St., Chicago, Ill.

WE ARE OFFERING

## BARCAINS

from the equipment of the United Electric Traction Company's Works of Marion, N. J., comprising:

Engine Lathes, from 14 in. to 48 in. swing.  
Hand Lathes, from 10 in. to 20 in. swing.  
Planers, from 24 in. x 5 ft. to 42 in. x 12 ft.  
Shapers, from 15 in. to 20 in. stroke.  
Drill Presses, all sizes up to 24 in. swing.  
Milling Machines, Plain and Universal.  
Brown & Sharpe Screw Machines.  
1 Large Newton Slotting Machine.  
1 Large Pond Mach. Tool Co.'s Radial Drill Press.  
8 Gould & Eberhardt Automatic Gear Cutters, 36 in., 48 in. and 60 in.  
1 Betts Machine Co. Large Horizontal Boring Mill.  
2 Large Bliss Power Presses.  
1 10 H.-P. Baxter Engine, with 15 H.-P. Boiler, complete. As good as new.  
Also Tool Grinders, Die Sinks, Tapping Machines, Bolt Cutters and Large Pattern and Blacksmith Shop Equipments.  
These tools are in good order and of the very best makes in this country. They will be sold at remarkably low prices.  
Call at our salesroom and inspect them, or write for complete descriptive circular and price-list.

**THE GARVIN MACHINE CO.,**  
Laight and Canal Sts., New York.

## BLAST FURNACE

Blowing Engine, made by West Point Foundry. Cyl. 36 in. x 8 ft. stroke, two flywheels 27 ft. diameter, blowing cylinder attached to main piston. Will sell cheap. This is a modern and complete engine. Address **G. W. SCHULTZ & CO.,** 308 Walnut St. Philadelphia.

## FOR SALE.

50 H.-P. Cummer Engine, too small for our use. Good order. Can be seen running at our factory. **TURNER & SEYMOUR MFG. CO.,** Torrington, Conn.

1 9 in. stroke Sellers Shaper.  
1 12 in. " Bement " "  
1 6 in. " Barr " "  
1 8 in. " Smith & Coventry Slotter.  
1 9 in. " Bement & Miles " "  
2 28 in. x 10 ft. Heavy Lathes.  
2 5 ft. Gaskill Radial Drills.  
2 Overhead Drills.  
1 Dbl. Head National Bolt Cutter.  
1 Schlenker B. It-Cutter.  
1 Burdick Nut Maker.  
Every one a rare bargain.

**THOS. P. CONARD,**

206 Walnut Place, Philadelphia.

## FOR SALE.

9 in. Potter & McDougall Steam Hammer.  
500 ton Bushnell Knuckle Joint Press.  
30 in. Inlet Sturtevant Blower and smaller.  
5 tons ¾ in. and ½ in. Hoisting Chain.  
1000 ft. 1½ in. Rods and Turnbuckles.

**MARVIN BRIGGS,** 12 Broadway, N. Y.

## FOR SALE.

**ELECTRIC LIGHT PLANT** (used 6 months).  
1000 light Mather Dynamo.  
125 H.-P. Dick & Church Compound Engine.  
2 75 H.-P. Steel Boilers.

**MARVIN BRIGGS,** 12 Broadway, N. Y.

## SECOND-HAND MACHINERY.

**Boring Mill,** 10 ft. 4 in. swing, 56 in. under cross rail, table 7 ft. 6 in. in diameter.

**Boring Mill,** 8 ft. 4 in. swing, 48 in. under cross rail, table 6 ft. 6 in. in diameter, two heads on cross rail.

**76-in. Planer,** 13 ft. long; heavy and powerful.

**48-in. Car Wheel Borer.**  
**Axle Lathe.**

Write for photographs and further particulars.

Eastern Branch,

**NILES TOOL WORKS CO.,**

138 Liberty St., New York

## MACHINERY, TOOLS, &c.

**IN STOCK, LARGE LINE OF NEW AND SECOND-HAND engines, boilers and machinist's tools for sale or exchange.** Below are some special bargains:  
60 H.-P. Atlas Automatic engine.  
20 H.-P. to 60 H.-P. plain slide valve horizontal engines.  
2 H.-P. to 50 H.-P. vertical engines.  
Power shears, 1 in. iron, 36 in. Gap.  
4½ in. Pratt & Whitney cut-off machine.  
20 milling machines (Bement's).  
6 H.-P. and 10 H.-P. hoisting engines with boilers.  
1, 2, 4 and 6 H.-P. yacht engines.  
4 H.-P. and 7 H.-P. gas engines.  
4 50 H.-P. portable boilers.  
10 H.-P. to 100 H.-P. horizontal and vertical boilers.  
20 screw-cutting lathes of different sizes.  
Several rod-feed turning lathes.  
6 in., 12 in. and 15 in. shapers.  
24 in. and 36 in. planers.  
44 in. radial drill, 1¼ National bolt cutter.  
No. 3 Fowler press, 2 10 in. exhaust heads.  
25 lbs. Bradley and 10 lbs. Hotchkiss Hammers.

**FRANK TOOMEY,**

131 N. Third St., Philadelphia, Pa.

## SOME BARGAINS HERE.

1 Hendey Shaper, 15 in. stroke, Imp. vise.  
1 14 x 6 Screw Cutting Engine Lathe; new.  
4 H.-P. Comb. Engine and Boiler. Fine condition.  
2½ Hendey Cutting-off Machine. New.  
1 3 Spindle Garvin Drill Press, used 1 month.  
100 H.-P. Woodbury Engine. 2d-hand. Good order.  
2 50 H.-P. Woodbury Boilers. Good order.  
2 75 H.-P. Woodbury Boilers. Good order.  
1 20 H.-P. Woodbury Engine. 2d-hand.  
Also variety of Engines, Boiler Pumps, &c.  
And other machinery, new and second hand. Write for prices. **Machinists' Supply Company,** 39, 41 and 43 Central Ave., Rochester, N. Y.

## WANTED.

To furnish reasonable estimates on specialties in light metal work.  
**CLARK & COWLES,** Plainville, Conn.,  
Manufacturers of Clock Trimmings, Rivets, Springs, &c.

## CORLISS

and other Automatic Engines, Slide Valve Engines, Boilers, Steam Pumps, Tanks, etc., etc.

Corliss Engines, 10 x 20; 16 x 42; 23 x 36; 28 x 46; 26 x 60; 30 x 60; 30 x 72 and other sizes. Also Porter Allen, 14 x 30; 11 x 16; Slide Valve, Back Valve, Cut-off 18 x 36; Slide Valve, 16 x 48; 16 x 36; 14 x 24; 13 x 24; 10 x 24; a large assortment of Steam Pumps, one 1000 gal. Steam Fire Pump, Bogardus Mill, Simpson Crusher, Brennan Crusher, Ingersoll Rock Drill, 30 in. Burr Stone Mill, 8 and 9 ft. Fan Blowers, Platform Scales, 4 side Wood Planer and Matcher, &c., &c.

Also 4 Rendering Tanks, Round Tanks, Square Tanks, Jacket Tanks. Send for catalogue.

**G. M. CLAPP,**

74 Cortlandt St., New York.

## !!! FOR SALE !!!

**BAKER BLOWERS,** Nos. 1, 4½, 5, 6 and 7.  
**ROOT BLOWERS,** Nos. 1, 2, 3, 4, 5, 6 and 7.  
Sturtevant Blowers, Nos. 4, 5, 6, &c.  
1 Corliss Band Wheel, 12 ft. x 24 in. in halves.  
A Variety of Machinery, such as Boilers, Engines, Pumps, Crushers, &c. very cheap.  
Do you want to buy or sell Machinery? If so, write **C. R. BIGELOW,** Machinery Expert, 45 Dey St., New York City.

## 16 INCH FLAT MILL.

For sale cheap. Made by Garrison & Co., Pittsburgh; complete and modern; 3-roll high, flywheel 20 tons, 5 sets Housings, pinions, rolls, bedplates, &c., in perfect condition. Address

**G. W. SCHULTZ & CO.,**  
308 Walnut St., PHILADELPHIA.

## MACHINE TOOLS,

New and Second-hand, For Sale.

Hendey's "Norton" Screw Cutting Lathes. Cut 12 threads without changing any gears. 36 speeds for the side feed.  
Garvin Screw Machines.  
Dwight Slatte Sensitive Drills.  
A line of second-hand Tools, also small Electric Fan Motors.

**DANIEL KELLY,**

51 N. 7th St., Philadelphia, Pa.

4 3 H.-P. Vertical High Pressure Engines.  
2 5 H.-P. " "  
3 6 x 10 Horizontal Engines.  
2 8 x 12 " "  
2 10 x 14 " "  
8 5 H.-P. Gas Engines.  
5 10 H.-P. " "  
1 8 x 12 D. C. Hoisting Engine.  
3 Rock Crushers.

**H. H. MANSFIELD,**

126 Liberty St., New York.

## For Sale, Cheap LOCOMOTIVES AND CARS.

Standard and narrow gauge boarding, box, coal, flat, refrigerator and passenger Cars. Also large quantities of relaying and scrap rails, car wheels and scrap, pig iron, muck bars, &c.

**G. H. SIBELL & CO.,**

62 and 64 Michigan Ave., Chicago, Ill.

## Trustee's Sale of Machine Shop Equipment

Lathes, 52 in. swing by 41 ft., 54 in. swing by 22 ft. 30 in. swing by 22 ft.  
Planers, 54 in. wide by 20 ft., 48 in. wide by 20 ft., 36 in. wide by 13 ft.  
Drills, 36 in. upright, 5 ft. post, 20 in. post.  
Engines, 5 new and 7 second-hand, from 100 H.-P down.  
Circular on application  
**W. A. BOLE,** Trustee,  
Liberty Ave., cor. 25th St., Pittsburgh, Pa.

## FOR SALE.

7 3-ft. and 2 standard gauge Locomotives.  
1 Marion Steam Shovel.  
25 tons of 30-lb. Steel Rails.  
13 2-yard 3 ft. gauge Contractors' Cars.  
Engines and Boilers, large and small.  
16 Hoisting Engines.  
Rail, Bar, Sheet and Clipping Shears.  
Ore Grinding Pans.

**THOMAS CARLIN'S SONS,**  
Allegheny, Pa.

**MACHINERY,**

NEW AND SECOND-HAND, FOR SALE.

**LATHES.**

80 in. x 18 1/2 ft., Geared Face Plate.  
 52 in. x 36 ft., Rod Feed only; one end has Hor. Boring Machine.  
 48 in. x 27 ft., cheap.  
 36 in. x 18 ft., Geared Face Plate.  
 36 in. x 16 ft.  
 33 in. x 27 ft.  
 32 in. x 16 ft.  
 28 in. x 22 ft., cheap.  
 24 in. x 10 ft.  
 25 in. x 12, 16, 20 and 24 ft.

**PLANERS, SHAPERS, SLOTS.**

5 ft. x 22 in. 8 ft. x 31 in. 8, 12, 15, 16 in. stroke  
 4 1/2 ft. x 24 in. 16 ft. x 42 in. Shapers.  
 6 ft. x 24 in. 22 ft. x 62 in. 15, 20, 26 in. stroke  
 5 ft. x 25 in. 22 ft. x 72 in., 4 Shapers.  
 5 ft. x 28 in. heads. 8, 10 in. stroke Slot-  
 7 ft. x 26 in. ters.

Lincoln Millers Gang Drills, Screw Machines.  
 Steam Hammers, 100, 1000 and 3000 lbs.  
 Drill Presses, 20, 24, 26, 28, 30, 44 in. Upright.  
 Gear Molding Machine, Scott's Pat., 3 different sizes.  
 Brown Engine, 16 in. x 48 in.  
 Vertical Engine, 13 in. x 16 in., N. Y. Safety Steam  
 Power Co.  
 Send for latest list.

**GEO. PLACE MACHINE CO.,**

120 Broadway, New York.

**FOR SALE.**

500 tons Relaying Steel Street Rails, side bearing. Also 25-lb. section Relaying Iron T Rails, and 100 tons 65-lb. steel T Rails.

WM. H. PERRY &amp; CO.,

Providence, R. I.

**WANTED.**

Foundry Contracts to be completed before September 1st. Capacity of works, 9 tons per day. Can make close prices and prompt shipment.

FRANK C. PATTEN CO.,

Sycamore, Ill.

**FOR SALE CHEAP.**

50 tons of 56-pound, 150 tons 60-pound and 200 tons of 50-pound second-hand Steel Rails, suitable for relaying. For prices, &c., address

J. H. RICHARDSON &amp; CO.,

Pittsburgh, Pa.

**BICYCLE MANUFACTURING PLANT FOR SALE.**

Located in a prominent Western city and adapted to the manufacture of bicycles of any grade. Capital required, \$75,000 to \$100,000. Good orders for season of 1894 assured. For particulars apply to

THE R. M. CO.,

P. O. Box 31, Cincinnati, O.

**Second-Hand Rails****FOR SALE.**

In lots to suit, and ready for delivery.

2000 tons 60 lb. Steel T Rails.  
 800 tons 54 lb. Steel T Rails.  
 400 tons 50 lb. Steel T Rails.  
 550 tons 50 lb. Iron T Rails.  
 600 tons 45 lb. Iron T Rails.  
 2000 tons 40 lb. Steel T Rails.  
 600 tons 30 lb. Iron T Rails.  
 150 tons 40 lb. Steel T Rails.  
 200 tons 25 lb. Steel T Rails.  
 1700 tons Johnson Girder Rails, 38, 48, 52 and 66 lb. Rails.

All selected and in excellent condition for relaying and only slightly worn. For prices and particulars apply to

JOSEPH JEWKES,

Railway Equipment, Pittsburgh, Pa.

**A Successful Rolling Mill**

Is desirous of undertaking the manufacture of horse and mule shoes. Correspondence is solicited with parties owning or controlling a good horse shoe machine. Party preferred who is willing to take an interest in the business.

Address "C. B. &amp; Q."

office of The Iron Age, 96-102 Reade St., N. Y.

**FOR SALE.****LOCOMOTIVE STYLE BOILERS,**

all sizes; fitted to suit customers.

100 H.-P. Corliss Engine.

5 ton Ice Plant.

New and second-hand Pumps, and a general line of Machinery.

Plants fitted complete.

**CHESTER BERTOLETTE & CO.,**

Norristown, Pa.

**FOR SALE.****STEEL STREET RAILS, Side and Center Bearing.**

Fit to relay. Apply to

**DAN'L W. RICHARDS & Co.,**

92 Mangin St., New York.

**FOR SALE.**

2 Double Deck Boilers about 40 H.-P. each, cheap. Hoisting Engine. Cylinder Boilers for Stacks, 30, 40 and 42 in. diameter. Round and Square Iron Tanks. Book Binding Machinery. Smoke Stacks, light and heavy, all sizes. Large lot Cast and Wrought Scrap Iron on hand. Also Dealers in Metals.

BUSSENIUS &amp; CUNLIFFE,

12th and Washington Ave., Philadelphia.

**FOR SALE.****CRANK and GEARED SHAPERS.**

Write us for Bargains.

**J. STEPTOE & CO., Cincinnati, O.****CLOSING OUT:**

We will sell the following equipment of a Foundry and Machine Shop to first comer:

1 Cement Foundry Cup, in good order, \$200.  
 1 Universal Milling Machine and Counter-shaft, \$135.

2 Large Boring Mills, 36 in. under Cross Rail, Table 48 in. diameter, price \$150 each.

1 Pecu Drop Hammer, complete, \$80.

1 Rumbler, for tumbling in oil, \$35.

100 Lathe Drip Pans, to catch Turnings, &c. \$1.40 each.

14 Foundry Rumlbers for small Castings, \$15 each.

Will be sold for Cash, f.o.b. cars Philadelphia. Write promptly to

**G. W. SCHULTZ & CO.,**

No. 308 Walnut St., Philadelphia.

**FOR SALE.**

1 Engine Lathe, 24 in. swing x 25 ft. bed. Modern. First-class condition.

1 Lincoln Miller. Good order.

1 3 in. Cutting-off Machine. Nearly new.

1 No. 1, No. 2 and No. 6 Root's Blower.

Prices very reasonable.

COOKE &amp; CO.,

163 and 165 Washington St., New York

**FOUNDRY.**

One of the largest and best equipped foundries in the State of Kansas, in a city of 25,000, with a good local trade, also large shipping trade. Well known throughout the Southwest. A fine opening for machine shop. Patterns all standing and almost new. No trash. Address

"No. 1 FOUNDRY,"  
 office of The Iron Age, 96-102 Reade street, N. Y.

**For Sale, at One-half Price.**

About 85 ft. of 5 in. diameter Steel Shafting; 5 1/2 pairs of Heavy Flange Couplings; 8 Pillow Blocks, with Caps for same. All in good condition. In use but a short time, and replaced with heavier shafting the reason for selling. For price and full particulars address

VULCAN IRON CO., Ltd., New Castle, Pa.

**STEEL TUBES:**

A patented process, of great value, seeks financial aid to complete plant and provide a sufficient working capital. A very liberal arrangement can now be made. "OWNER," Box No. 1036, New York Post Office.

**Locations for Factories.**

The Industrial Department of the Chicago, Milwaukee & St. Paul Railway has charge of matters pertaining to the development of the territory traversed by the railroad and the directing of manufacturers to points best suited to their particular requirements.

Eight States are traversed by the 6,150 miles of the Chicago, Milwaukee & St. Paul Railway's tracks, namely: Illinois, Wisconsin, Northern Michigan, Iowa, Missouri, Minnesota, South Dakota and North Dakota.

The company is daily in touch with the people in its territory, and from the number and varied nature of the industries locating and springing up on the line, and its acquaintance with the natural resources, has the facilities at hand to promptly furnish manufacturers with reliable information as to locations adapted to particular industries.

LUIS JACKSON,

Industrial Commissioner,

C., M. & St. P. R'y, 160 Adams Street,  
 Chicago, Ill.

**LUXURY ON WHEELS.**

The "Electric" trains of the Cincinnati, Hamilton & Dayton R. R. and "Monon" Route between Cincinnati and Chicago are provided with the latest product of the Pullman Co. built expressly for this service. There are 10 compartments in each car, which may be converted at will into complete drawing rooms, most beautifully and harmoniously decorated, lighted by the Pintsch gas system, and are positively the most modernly equipped sleeping cars in the world. This is the only line running Pullman Vestibule and Dining Cars between the cities named. THE World's Fair Route. See that your ticket reads C., H. & D. and Monon Route.

D. G. EDWARDS, G. P. & T. Agent,  
 Cincinnati, O.

**WANTED TO BUY.**

Cold Rolled Scrap Steel, 4 ft. long, 3 to 5 in. wide, No. 16 or 18 gauge, or oblong pieces, 12 x 16.

PULLMAN SASH BALANCE CO.,  
 Rochester, N. Y.

**WANTED.**

Two or three 80 to 100 lbs. Bradley Cushioned Helve Hammers. Must be in good condition. Cheap for cash. Address  
 DANIEL L. HEISKELL, Wheeling, W. Va.

**\$99.50 FREE.**

For 50c. I will send you a pamphlet containing 50 well written advertisements, each of which is worth easily \$200. If you want to catch the trade of your town send 50c. in stamps and get pamphlet by return mail.

Thousands already in use.  
 J. A. DUFFY, - 118 Main St., Hannibal, Mo.

**CHARLES WEILAND.**

I make a special business of buying and selling  
 Job Lots of

**HARDWARE AND CUTLERY.**

Tools and Second Quality Files a Specialty.

Send for Catalogue.

**143 Chambers St., New York.****IF YOU WANT****A NIAGARA DYNAMO OR MOTOR**

or if you are a dealer and want an Agency  
 send for our Catalogue and Price-List.

**LOVELL MFG. CO., LTD., ERIE, PA.**

**OFFICE OF LIGHT-HOUSE INSPECTOR.**  
Third District, Tompkinsville, N. Y., September 11, 1893.—Proposals will be received at this office until 12 o'clock M., on Saturday, the 30th day of September, 1893, for furnishing to the Light-House Establishment Iron Buoys and Appendages, and Mooring Chain, required during the fiscal year ending June 30, 1894. The articles to be furnished embrace nun, can, bell, whistling, wooden spar, and ice buoys, shackles, mooring chain, ballast balls, iron and stone sinkers, etc., all of which are enumerated in the specifications attached to the form of bid, which may be obtained on application to this office. Contracts will be awarded on each item separately, and bidders will be required to deliver the articles on or before the dates named in the specifications. The right is reserved to reject any or all bids, to strike out any item or items in the specifications, to waive any defects, and to require the delivery of a greater quantity, not to exceed one-half of any item, than the quantity stated in the specifications, at any time during the fiscal year. A clause to that effect will be inserted in the contract. Proposals will be subject to the above conditions. W. S. SCHLLEY, Captain, U. S. N., Light-House Inspector, Third District.

**OFFICE OF THE LIGHT-HOUSE ENGINEER.** Seventh District, New Orleans, La., September 23, 1893.—Sealed proposals will be received at this office until 2 o'clock P. M. of Tuesday, the 24th day of October, 1893, for furnishing materials and labor of all kinds necessary for the completion and delivery of the metal-work for the beacons for Tampa Bay, Florida. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids and to waive any defects. JAMES B. QUINN, Major of Engineers, U. S. A., Light-House Engineer, Seventh District.

## WANTED.

To purchase a Second-hand Three-High Rolling train, with necessary rolls for manufacturing common sizes of merchant bar on a limited scale. Give full particulars, stating condition of rolls, etc., with lowest price. Address  
"TRAIN,"

Office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

## FOR SALE.

One No. 5 Gates Rock Breaker with revolving screen, engine, boiler, winding drum, wire rope, dump cars, rails, turn table, steam drill, picks, shovels, sledges, striking hammers, steel drills, crow bars, etc., etc.

One No. 6 Gates Rock Breaker with revolving screen, engine, boiler, endless cable drums, wire rope, dump cars, rails, turn tables, picks, shovels, sledges, striking hammers, steel drills, crow bars, etc., etc.

FLORENCE SILICA WORKS,  
Cumberland, Md.

## BOILERS AND SHEARS FOR SALE.

Two Tubular Boilers, 48 in. diameter, 16 ft. long, with fronts, grate bars and fittings complete. Also one Double Deck Tubular Boiler, without settings. All guaranteed for 90 lbs. steam. 1 large lever Plate Shear, cutting to 3/4-in. plate. 1 Rotary Trimming Shear, will cut 8-16 in. Apply to  
MARSHALL BROS. & CO.,  
1156 Beach St., Philadelphia, Pa.

## FOR SALE.

New Double Winch Engine, design of Will Jamson Bros., cylinders 8 in. x 8 in., friction gears 8 to 1 and 4 to 1. Price and full particulars on application.

S. C. FORSAITH MACHINE CO.,  
Manchester, N. H.

## HARDWARE BUSINESS FOR SALE.

The Hardware, Housefurnishing and Carriage Goods Business established over 65 years' and carried on by the late Charles P. Strong, in New Brunswick, N. J., together with the store, property and good will, is offered for sale to close his estate. A fine opportunity for a stock company. For particulars and terms apply to WILLIAM DUNHAM, Jr., WILLIAM P. VOORHEES, Executors of C. P. Strong deceased, New Brunswick, N. J.

## FOR SALE.

A small Hardware and Tinware business, doing a strictly cash business, on the very liveliest part of a very lively business street of the southern and most promising part of Chicago. Owner going in the country. Other business. Terms cash only. Address  
"HARDWARE,"

Office of *The Iron Age*, 59 Dearborn St., Chicago.

## FOR SALE.

Complete stock of Hardware, Stoves, Tinware, Paints, Oils, &c., in a thriving city of 3500 in Northeastern Indiana. Invoice about \$6500. Also in an adjoining town, similar stock of about \$8500. Rare opportunity for a cash customer. Business established in 1852.

F. E. DAVENPORT, Assignee.  
Auburn, Ind.

## EUGENE BISSELL, Auctioneer. E. BISSELL, SON & CO.,

Successors to  
HAYDOCK & BISSELL,  
WHOLESALE  
HARDWARE AUCTIONEERS,  
12 Murray St. and 15 Park Place, N. Y.  
Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

## Collections?

ATTENTION! Merchants and Manufacturers.—We collect your past due accounts. Do not let them remain too long upon your books. Our terms just and fair.

THE HARDWARE BOARD OF TRADE, Ltd.  
4 and 6 Warren Street, New York.  
JAS. H. GOLDEY, Treas.

## WANTED.

### Twelve inch Train of Rolls.

Wanted at once 12 in. Train of Rolls new or second-hand.

JANSON IRON COMPANY,  
Columbia, Pa.

## C. F. RICE,

206 So. Green St., - - (CHICAGO).

Largest wholesale house in America for Mirrors of all kinds, Pictures, Mouldings, Frames, Brackets, Easels, Screens and kindred goods. Large illustrated catalogue sent to Dealers upon application.

## Safe Gold Loans.

Portland, Oregon,

### The Title Guarantee & Trust Co.

has special facilities for placing money at 6 to 8 per cent. on improved city property with insured titles, secured by first mortgage, principal and interest repayable in GOLD.

W. M. LADD, Pres. BUELL LAMBERSON, Vice-Pres.  
J. THORBURN ROSS, Sec.

Reference: National Park Bank, New York.

## THE LATEST BOOKS.

**How to Use Electrical Measurement Apparatus.** By CHAS. P. FREY. A Manual of Practical Information Relating to Electrical Testing. Illustrated. 8vo, paper.....50c.

**Lectures on Sanitary Law.** By A. WYNTER BLYTH. 8vo, cloth.....\$2.50

**Directory of American Gas Companies.** By C. E. BROWNE. Gas Statistics. 7th year. 8vo, cloth.....\$5.00

**Portable Electricity: Being a Treatise on the Application, Methods of Construction and Management of Portable Secondary Batteries.** By J. T. NIBLETT. Fully illustrated. 8vo, cloth.....\$1.00

**The Progress of Marine Engineering, from the Time of Watt to the Present Day.** By THOS. MANN. 67 illustrations. 12mo, cloth.....\$3.00

**Plumbing, Drainage, Water Supply and Hot Water Fitting.** By JOHN SNEATON. 222 illustrations. 8vo, cloth.....\$3.00  
Contents: Introduction; drainage; danger from city wells; external plumbing; internal plumbing and fittings; sanitary plumbing; water service, and tapping of mains under pressure; water supply; ornamental leadwork; heating; hot-water work; index.

**Electrical Distribution.** By M. H. KILGOUR, H. SWAN and C. H. W. BIGGS. Its Theory and Practice. 174 illustrations. 12mo, cloth.....\$4.00

**The Plumber and Sanitary Houses.** By S. S. HELLIER. 5th edition. Royal 8vo.....\$5.00

**Plate Girder Construction.** By ISAMI HIROU, C. E. Revised Edition. 16mo, cloth. New York, 1893 (Van Nostrand's Science Series No 95).....50c.

**The Dynamo, How Made and How Used.** By S. R. BOTTONE. Eighth edition, with additional matter and illustrations. 12mo, cloth.....\$1.00

**Warm Air Furnace Estimate Book.** By DANIEL P. HOLMES. Cloth.....50c

**The Electric Transmission of Intelligence.** By PROF. E. J. HOUSTON. And other Advanced Primers of Electricity. 88 illustrations. 12mo, cloth.....\$1.00

**Varnishes, Lacquers, Printing Inks and Sealing Waxes: Their Raw Materials and Their Manufacture.** By W. T. BRANN, to which is added the art of varnishing and lacquering, including the preparation of putties and of stains for wood, ivory, bone, horn and leather. 336 pages with 39 engravings. 12mo, cloth.....\$3.00

**Twenty Years' Practical Experience of Natural Asphalt and Mineral Bitumen.** By W. H. DELANO. Illustrated. 12mo, parchment.....50c

**Knots, Splices, Hitches, Bends and Lashings.** By F. R. BRAINARD. Illustrated and described. 76 pages, 16mo, cloth.....\$1.00

**A Treatise on Shoring and Underpinning.** By C. H. STOCK. 2d edition, 60 pages, 8vo.....\$1.75

**The Dynamo, Its Theory, Design and Manufacture.** By C. C. and F. WALLIS HAWKINS. 190 illustrations. Thick 12mo, cloth. (The Specialists' Series).....\$3.00

**Practical Dynamo Building.** By L. C. ATWOOD. With Detail Drawings and Instructions for Winding. Giving correct sizes of Wire, Dimensions of Iron, etc. etc., also Diagram for House Wiring. Illustration and Plates. 4to, cloth.....\$3.00

**The Annual Statistical Report of the American Iron and Steel Association for 1893.** 104 pages, 8vo.....\$3.00

**Dynamos, Alternators and Transformers.** By G. D. KAPP. Giving an exposition of the general principles underlying the construction of dynamo-electric apparatus without the use of high mathematics and complicated methods of investigation. 12mo, cloth.....\$4.00

**The Heating of Large Buildings.** By A. R. WOLF. Illustrated, 8vo, paper.....\$ 25

**A Handbook on the Steam Engine.** By HERMAN HAEDER, C. E. With especial reference to Small and Medium sized Engines. For the Use of Engine Makers, Mechanical Draughtsmen, Engineering Students and Users of Steam Power. English Edition, Re-edited by the Author from the Second German Edition, and Translated with considerable Additions and Alterations by H. H. P. FOWLES, A. M. Inst. C. E. 12mo, cloth. 450 pages, and nearly 1100 illustrations. Cloth.....\$3.60

**The Manufacture of Liquors and Preserves.** By J. DE BREVANS. 65 illustrations and 18 Tables. 12mo, cloth.....\$3.00

**Steamships and Their Machinery: from First to Last.** By J. W. C. HALDANE. Plates and illustrations. 8vo, cloth.....\$6.00  
Contents: Works and Their Machinery—Shipbuilding—Design and Construction of Engines and Boilers—Also Auxiliaries for Hoisting, Steering, Refrigerating, Electric Lighting, Etc.

**Modern Guns and Smokeless Powder.** By A. RIGG and J. GARVIE. Influence of modern explosives upon modern guns. Forces required to propel a shot. Curve of pressure. Comparison between results observed and calculated. Foreign Guns. Modern Explosives. Gun-cotton. Nitro-glycerine. Smokeless powders. Cordite. Various smokeless powders. Machinery required for manufacturing modern explosives. \$3 pages, 8vo, paper.....\$2.00

**Text Book of Comparative Geology.** By PROF. E. KAYSER. Translated and edited by PHILIP LAKE, M.A. 596 illustrations (73 plates and 70 figures in the text), 8vo, cloth.....\$4.50

**Practical Sanitation.** By G. REID. With appendix on Sanitary Law by HERBERT MANLEY. Second edition, 12mo, cloth.....\$2.40

**A Practical Treatise on Foundations,** explaining fully the principles involved. With descriptions of all of the most recent Structures, accompanied by numerous drawings; also an accurate record of the Bearing Resistances of Materials as determined from the loads of actual structures. By W. W. PATTON, C.E. 21 full page plates. 8vo, cloth.....\$5.00

**A Manual on Lime and Cement,** their treatment and use in construction. By A. H. HEATH. 215 pages, with folding plate, 12mo, cloth.....\$2.50

**Metal Plate Work. Its Patterns and Their Geometry,** also notes on metals and rules in mensuration for the use of tin, iron and zinc plate workers, &c. By C. T. MILLIS. Second edition, revised and enlarged. 377 pages, 314 illustrations, 12mo, cloth.....\$3.50

**Public Health Laboratory Work.** By HENRY R. KENWOOD, M.B. Including Methods Employed in Bacteriological Research, with special reference to the Examination of Air, Water and Food, contributed by ROBERT BOYCE, M.B. Illustrated. 12mo, cloth.....\$3.00

Sent, post-paid, on receipt of price, by

DAVID WILLIAMS, PUBLISHER & BOOKSELLER

96-102 READE ST., NEW YORK.

**HELP WANTED.**

*Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.*

**FOREMAN** for architectural iron works; must be steady and able to manage a moderate number of men to advantage. Address "M. L.," Box 914, office of *The Iron Age*, 96-102 Reade Street, New York.

**FOREMAN** for ornamental iron works, stairs, grille work, railings, etc. Address "H. R. CO.," office of *The Iron Age*, 96-102 Reade Street, New York.

**A PRACTICAL MAN** who can control some trade in foundry and machine business to take an interest in an established business in Brooklyn, N. Y., which is well equipped to manufacture any line of iron or wood-working specialties. Address "PROGRESS," office of *The Iron Age*, 96-102 Reade St., New York.

**MANUFACTURERS' AGENTS** and Salesmen on commission to sell Juvenile bicycles, velocipedes, tricycles, iron wagons, goat sulkies, toy barrows, doll cabs. THE GENDRON IRON WHEEL CO., Toledo, Ohio.

**SALESMAN** thoroughly acquainted with retail hardware and tinware trade to represent a manufacturer in each of the following states; Iowa, Michigan, Minnesota, Indiana, Wisconsin, New York, Illinois, Missouri, Pennsylvania, Ohio, Nebraska, Kansas, Massachusetts; must furnish first-class references. "MANUFACTURER," office of *The Iron Age*, 59 Dearborn St., Chicago.

**SITUATIONS WANTED.**

*Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.*

**BY A MASTER MECHANIC.**—A practical and experienced master mechanic, expert on critical machinery; experimenting a specialty; practical draftsman and capable of taking charge of work; can give the highest recommendation from his late employers. Address "C. D.," office of *The Iron Age*, 96-102 Reade St., New York.

**AS FOREMAN** of Iron Foundry, by a practical foundryman; 30 years' experience, 15 as foreman; can handle men to advantage on heavy work, green sand, dry sand and loam work; have excelled on loam work; best of reference from past employers. Address "J. W. FOUNDRYMAN," office of *The Iron Age*, 96-102 Reade St., New York.

**BY A THOROUGHLY Practical Sheet Mill Manager** of many years' experience; good reference. Address "THOROUGHLY PRACTICAL," office of *The Iron Age*, 96-102 Reade St., N. Y.

**BY A MECHANICAL ENGINEER**, first-class draftsman, graduate from the German Polytechnic High School as Government machine engineer with two years' practical experience; secured highest award for competitive work in the construction of modern derricks. Address D. KOPS, 500 Broadway, New York City.

**BY A GUIDE MILL ROLLER**; have had 8 years' experience in guide mill rolling on all sorts of small iron and steel; am strictly temperate, and can give good references as to ability and character. Address "GUIDE MILL," office of *The Iron Age*, 96-102 Reade St., N. Y.

**SHEET MILL SUPERINTENDENT**; qualified man seeks position; has had English and American experience; understands the strict economy of manufacture, iron or steel, common or smooth finish roofing sheets, black plates for tinning, also heavy plates; familiar with all details of operation or construction. Address "SHEETS," office of *The Iron Age*, 96-102 Reade St., New York.

**BY A YOUNG SCOTCHMAN**, having 9 years' experience in wholesale and retail hardware houses, both in office and store; will go to any part of States; can furnish references as to character and ability; moderate wages; age 27. Address "M. A. M.," Box 921, office of *The Iron Age*, 96-102 Reade St., New York.

**A YOUNG MAN** with experience, and familiar with the trade in Virginia and West Virginia, would like to represent some good manufacturer of explosives, beginning January 1. Address "EXPLOSIVE," office of *The Iron Age*, 96-102 Reade St., New York.

**AN EXPERIENCED HARDWARE MAN**, with extensive acquaintance among larger class of buyers East and West, having office in New York City, as agent for a first-class manufacturing company for domestic and export trade, desires to represent some additional line of manufacture in metal, hardware or kindred line at a moderate salary. Address "HARDWARE MAN," No. 921, office of *The Iron Age*, 96-102 Reade St., New York.

**MECHANICAL ENGINEER** will be open for engagement November 1; have held position of foreman pattern shop, chief draftsman and superintendent of construction; well up in modern shop practice, willing to go anywhere; all references from past and present employer. Address "THEORY," office of *The Iron Age*, 59 Dearborn St., Chicago.

**SITUATION** wanted by traveling salesman having extensive acquaintance with jobbers of hardware and with carriage manufacturers in 23 states. Thoroughly familiar with all kinds of carriage material, and some line of such goods preferred, but would handle another line. Reference past employers. Address "CARRIAGE HARDWARE," office of *The Iron Age*, 96-102 Reade St., New York.

**AS FORMAN** of iron foundry, have had 14 years' experience as forman. Understands cupola practice thoroughly, and handling of men at work. All reference as to ability and character. Address "CUPOLA PRACTICE," office of *The Iron Age*, 96-102 Reade St., New York.

**A WELL KNOWN** and successful Blast Furnace Superintendent or Founder will be open for engagement after Oct. 1st, 1893. Is thoroughly competent as constructor or in the management. Practical, theoretical and in touch with latest improvements in blast furnace practice. First-class record and references. Address "BLAST FURNACE, No. 921," office of *The Iron Age*, 96-102 Reade St., New York.

**BY A MIDDLE AGED** married man; has had many years' experience as bookkeeper, special accountant, keeping cost sheets, etc., of the various articles manufactured in machine shop, boiler shop, foundry and wire mill work; thoroughly understands business, clerically, in all details. Address "CLERICAL," office of *The Iron Age*, 59 Dearborn St., Chicago.

**FURNACE Fire Brick Layer**; a young man desires an engagement; competent and experienced in building and repairing all kinds of furnaces and setting of boilers; ten years' experience in charge of brickwork of plants; good references. Address "W. H. H.," Box 914, office of *The Iron Age*, 96-102 Reade St., New York.

**MECHANICAL ENGINEER** is open to engagement; firms requiring the services of a thorough practical man, combining both mechanical experience and sound business discrimination, to establish manufacture, reorganize and otherwise put their business on a good paying basis should communicate with "HOKB," office of *The Iron Age*, 96-102 Reade St., New York.

**MECHANICAL ENGINEER** and superintendent (36), now engaged as such with manufacturing company, desires a change; experienced designer and manager of men; 16 years' practice in railroad, rolling mill, gas and water works machinery; best of references. Address "COLUMBIA," office of *The Iron Age*, 59 Dearborn St., Chicago.

**A PRACTICAL** man with many years' experience at the bench and as foreman in one of the largest woodworking machine shops in the world desires a position in the latter capacity or as superintendent; best of references furnished. Address "WOON," office of *The Iron Age*, Rooms 22-24 Pickering Building, Cincinnati, Ohio.

**STENOGRAPHER** and bookkeeper, five years' experience in coal and iron business, thoroughly acquainted with all branches of office work and voucher system, desires permanent employment of like character in good locality after October 1st; best references furnished; age 22. Address "STENO," office of *The Iron Age*, 96-102 Reade St., New York.

**BY A MEMBER** of the A. S. M. E., expert in shop management and economical production of machinery, as superintendent or manager; well posted on dynamical, hydraulic and mechanical engineering and inspection of materials. Address "W. O. W.," office of *The Iron Age*, 96-102 Reade St., New York.

**MANUFACTURERS' AGENT**, having an office in New York City and at present representing an out of town house, will shortly be open for engagement and desires to negotiate with a firm with a view to obtaining position as representative or traveling salesman. Address "REPRESENTATIVE," office of *The Iron Age*, 96-102 Reade St., New York.

**HARDWARE SALESMAN** with established trade in Pennsylvania, Maryland, parts of Virginia, Ohio and New Jersey wants position with good house; will be satisfied with terms which are mutually fair; can prove ability in short time; good references, also good reasons for wishing to change. Address "HARDWARE," office of *The Iron Age*, 220 S. 4th Street, Philadelphia.

**ACTIVE BUSINESS MAN**, of 33 years, wishes an opening; could command some capital. Address, stating nature of business, "A. B.," Box 914, office of *The Iron Age*, 96-102 Reade St., New York.

**A THOROUGHLY Competent, wide-awake man, 15 years' practical experience** as a rolling mill manager, would like to correspond with parties needing such help now or in the near future. Address "WIDE-AWAKE," office of *The Iron Age*, 96-102 Reade St., New York.

**AN ACTIVE BUSINESS MAN**, with considerable experience in the management of coal and iron properties, including mines, blast furnaces and rolling mills, desires a position of trust and responsibility; is competent to fill an executive office. Address "W. W.," 1027, office of *The Iron Age*, 96-102 Reade St., New York.

## You ought to.

A GREAT many merchants are using **Ladd's Discount Book.**

Every day adds to the number of those who highly esteem this valuable work. Very many people both in America and abroad have commended it highly as a time-saver and money-earner. It is positively

**Accurate**, Saving many times its cost in preventing errors.

**Rapid**, = = Saving much valuable time, and "Time is Money."

**Practical**, As proved by its constant use by those who would not now do without it.

The cost is small, the book will last for years, you can depend upon the results without proving.

A great many bright people are using LADD'S DISCOUNT BOOK, and

## You ought to.

Regular Edition, \$3.00 } Sent postpaid  
Double Indexed, 4.00 } upon receipt  
of price by

**DAVID WILLIAMS,**

Publisher and Bookseller,

96-102 Reade Street, - New York.

## BLOWING ENGINE FOR SALE

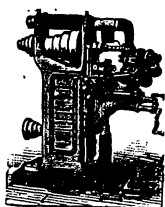
Vertical pattern, with balanced steam slide valve gear, steam cylinder 14 in. diameter, air cylinder 40 in. diameter, stroke 24 in. 1 to 100 strokes per minute; engine new.

**JAMES LEFFEL & CO.,** Springfield, Ohio.



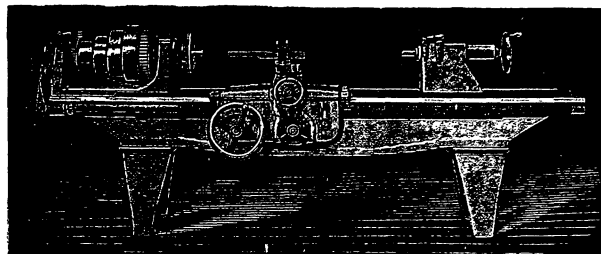
## Among Milling Machines

Ours is **CHEAPEST** to OPERATE



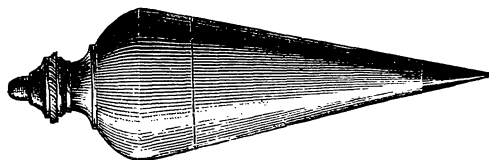
Because it takes less time to get ready for and finish a job than on other machines. As to workmanship and price we invite investigation. Our catalogue will help you in selecting the best for your money.

**The Cincinnati Milling Machine Co.,**  
CINCINNATI, OHIO.



TURRET  
MACHINES  
LATHES,  
MILLING  
MACHINES,  
SPECIAL  
MACHINERY,

**JOHN L. BOGERT, FLUSHING, N. Y.**



We carry a full line of adjusted  
**PLUMB BOBS** varying from 2  
oz. to 24 oz., by ounces. List on ap-  
plication.

**THE FRASSE CO.,**  
19 Warren St., - New York City.

## All Wrought Steel Center Neck Yoke.



The Strongest, Lightest, Cheapest Yoke on the Market.  
Send for Price-List and Discount.

**S. C. JOHNSON, - - Racine, Wis.**

## The English and American Mechanic:

AN EVERY-DAY HAND-BOOK FOR THE WORKSHOP AND THE FACTORY.

CONTAINING

Several Thousand Receipts, Rules and Tables indispensable to  
the Mechanic, the Artisan and the Manufacturer.

By B. Frank Van Cleave.

A new, revised, enlarged and improved edition, edited by Emory Edwards, M.E.

ILLUSTRATED WITH EIGHTY-FIVE ENGRAVINGS.

In one volume, 500 pages, 12mo, closely printed, containing a vast body of information of value  
to all practical men. Elegantly bound in scarlet cloth, gilt. Price \$2.00.

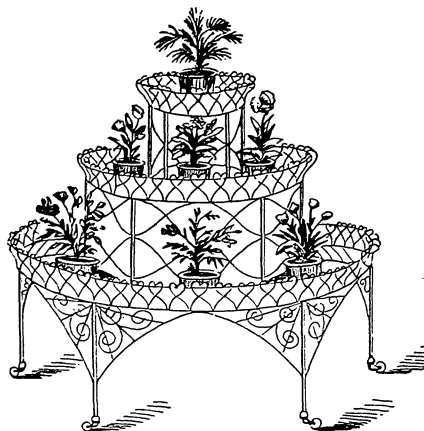
SENT POSTPAID, ON RECEIPT OF PRICE, BY

**DAVID WILLIAMS, Bookseller and Publisher.**

96-102 Reade Street, NEW YORK.

F

## FLOWER STANDS.



Interior Wire Work. Bank and  
Office Wire Work. Brushes.  
Wire Goods of every  
description.

### CORN POPPERS.

MADE BY

**CINCINNATI MFG. CO., CIN., O.**  
WRITE FOR CATALOGUE.



**RAILS**, Second Hand, Suitable for Relaying  
Cut to Lengths for Builders and Contractors.  
Old for Scrap. Dealers in all kinds of Rail-  
road Scrap. Correspondence solicited.

**SCHWARZENBERG BROS. & CO.,**  
167 to 189 Scranton Ave., - Cleveland, O.

## KEEP BOOKS

by WEST'S New Original-ENTRY LEDGER.

Make the same entry but once. A Ledger in place  
of a full set of books. Convenient forms for all  
entries. Easily applied, simple, saves time. West's  
Self-Proving Balance locates every error. Send 3  
2-cent Stamps for illustrated 16-page pamphlet.

**WOLCOTT & WEST, Syracuse, N. Y.**

**YOU** Can Tin Cast Iron as read-  
ily and cheap as Malleable  
Iron.

The Flanders process for tinning  
cast iron is now an assured success  
and is in use by some of the largest  
firms in the country. Correspond-  
ence solicited for the erection of  
galvanizing or tinning plants. Mr.  
W. T. Flanders will continue to  
superintend the building and start-  
ing of all plants. Address

**THOS. SANDS,**

Nashua, - - - N. H.



**J. POPPING'S**

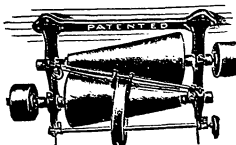
Patent

Machine & Tool Wks.

MANUFACTURERS OF

Solid Iron Shoulder Rabbet Planes, etc., etc.  
and Hoistatter's Patent Hair Picking machine  
N. E. Cor. 58 St. and 11th Ave. N. Y.

### EVANS FRICTION CONES.



For regulating the  
speed of machines au-  
tomatically or by hand.  
Thousands of sets in  
operation driving all  
kinds of machinery  
which require from 1  
to 50 H.-P. Address  
Evans Friction Cone Co.,  
85 Water Street,  
Boston, Mass.



# THE STEEL AND IRON IMPROVEMENT CO.,

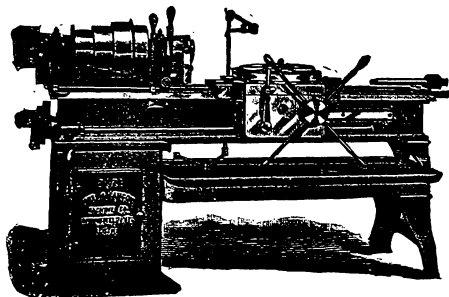
Controlling the Adams-Blair Process and other Steel and Iron Patents.

**High Grade Open Hearth Steel produced by the Adams-Blair Process at less than the Cost of BESSEMER Steel.**

**91 and 98 Fifth Ave., Pittsburgh, Pa.**

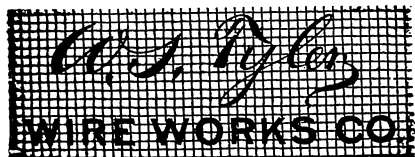
EASTERN OFFICE: 412 Drexel Building, Philadelphia, Pa.

## 2 BY 24 FLAT TURRET LATHE.



SEND FOR CATALOGUE FOR '92.

**Jones & Lamson Machine Co.,**  
SPRINGFIELD, VERMONT, U. S. A.



MANUFACTURERS OF

### "The Tyler"

Double Crimped Wire Cloth for Mining Purposes.

All meshes from two to the inch up to 100 mesh made and carried in stock.

W. S. TYLER, Pres. PROCTOR PATTERSON, Sec. & Treas.  
CLEVELAND, OHIO.

ANALYTICAL AND ASSAY LABORATORIES

—OF—

**DR. GIDEON E. MOORE**

221 PEARL ST., (Corner Platt St.) NEW YORK.

Assays of Ores, Metals and Metallurgical Products of every description.  
Analysis of Water, Ores, Minerals, Metals, Fuel, and Natural and Industrial Products generally.

PRINTED PRICE-LIST ON APPLICATION.

## ALUMINUM.

**The Pittsburgh Reduction Co.,**

116 Water St., Pittsburgh, Pa.,

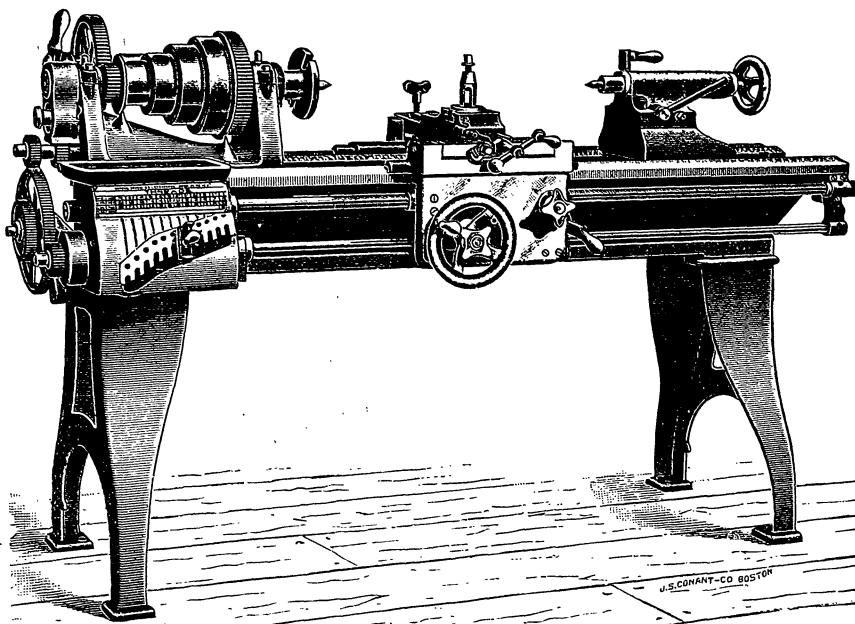
Offer Aluminum guaranteed equal in purity to the best in the market, at lowest rates obtainable.

ALUMINUM SHEET, WIRE,  
AND CASTINGS.

## The Norton Improved Screw Cutting Engine Lathe,

—MANUFACTURED BY—

**The Hendey Machine Co., Torrington, Conn.**



This lathe cuts 12 threads, viz.: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18 and 20, without changing gears. It also makes 12 different cuts for turning, viz.: 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 108 and 120 cuts per inch.

These various threads for screws, and cuts for turning, cover everything called for in every-day work. Other changes of gear can be made, and each additional change will give 12 additional screws or cuts per inch. The simplicity of the lathe makes its most valuable feature and we fully guarantee it in every way. Send for descriptive circular, and mention *The Iron Age*.

London Agents, **CHARLES CHURCHILL & CO., 21 Cross St., Finsbury, London, E. C.**

# PULLEY LATHES.

For Particulars apply to the

**NEWARK MACHINE TOOL WORKS,**

NEWARK, N. J.

'Tis Said That

The Man in the

Moon

Rides a "Stearns"

Wise, isn't He?

Send for our Art Catalogue.

**E. C. STEARNS & CO.,**  
Syracuse, N. Y.



**KEEP THE BALL ROLLING**

Live Dealers are doing this by keeping a well assorted stock of  
**B. & B. Oil & Gas Stoves.**

You can do the same. Get our Catalogue and discounts and follow directions.

**Prices to suit the Times.**

The shingle which we here display Has stood right well the test, And bears a name known everywhere—The **"Brightest and Best."**

**The Glazier Stove Co., Mfrs., CHELSEA, MICH.**

**W. W. MONTAGUE & CO., San Francisco, Cal., Agents for the Pacific Coast.**



The standard by which the merits of a Freezer are gauged is, how near it comes to being as perfect as the

**WHITE MOUNTAIN ICE CREAM FREEZER.**

It always has been, and is still, the best. Try them.

Manufactured by **The White Mountain Freezer Co., Nashua, N. H.**



**THE OLD RELIABLE STANDARD FREEZER**

has the reputation of being the **BEST ICE CREAM FREEZER** ever introduced. **STRENGTH, DURABILITY, NEATNESS AND EFFICIENCY** are prominent points in the manufacture. Full Size Can, **CEDAR TUB**, Detachable Hinged Crossbar, Self-adjusting Vibratory Scraper, etc.

Write for Illustrated Circular, Price-List and Discounts of **STANDARD, GOOD LUCK, MODEL and MACHINE Freezers.**

**CHAS. W. PACKER, Mfr.,**

**20 North Fourth Street, Philadelphia**

**THE "New" Keystone Beater,**

**FOR WHIPPING AND BEATING EGGS.**

**MIXING**

**BATTERS, DRINKS, SAUCES, ICINGS, POWDERS, ETC.**

**CREAMING**

**MELLOW FRUITS, BANANAS, PEACHES, BERRIES, BUTTER & SUGAR.**

**No. 20 for Family Use.**

**JAR ENTIRELY COVERED.**

**NO MORE SPATTERING.**

**CAN BE USED ANYWHERE.**

**STANDING OR SITTING.**

**ALWAYS READY FOR USE.**

**NOTHING TO BE FIXED.**

**SIMPLY PERFECT.**

No. 20.—Jar holds 1 quart level full. Complete Machine securely packed in one single package. 1/2 dozen packed in case.

MANUFACTURED ONLY BY

**NORTH BROS. MFG. CO.,**

Manufacturers of Hardware Specialties for Household use  
**American St. and Lehigh Ave., Philadelphia, Pa., U. S. A**



**Are You Here To Make Money?**

—O—

If so, the prices we are making on

**Oil Heaters and Gas Stoves**

will interest you.

We are making prices to suit your pocketbook.

Our new 80-page Catalogue is now ready. You can glean many points of interest from it. Ask for one.

**HARD PAN PRICES FOR QUICK SIGHTED BUYERS.**

Agents Wanted.

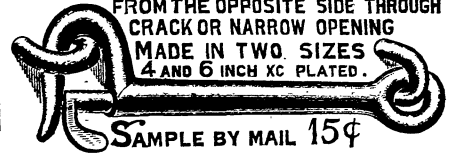


**30 POUND SYLPH.** Strongest Cycle of its weight on the market.

Guaranteed highest grade, and built for scorers and hard road riders. By using tubular hubs, front fork, saddle post, etc., we do away with forgings and use heavier tubing. Our system of lap-brazing makes joints as strong as any part of the tubing, and thus we get a lighter and by far stronger machine. Investigate. Catalogue free. **ROUSE-DURYEA CYCLE CO., 146 G St., Peoria, Ill.**

**COVERT'S SELF-LOCKING, GATE AND DOOR HOOK.**

**POSITIVELY PREVENTS BEING UNHOOKED FROM THE OPPOSITE SIDE THROUGH CRACK OR NARROW OPENING MADE IN TWO SIZES 4 AND 6 INCH XC PLATED.**



**Call for Our Banner Bolt Snap.**

This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substance and freezing, and is lower in price.

Made in all sizes; Round, Loop and Open Eye. We are headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

**Covert's Saddlery Works,**

**FARMER, N. Y., U. S. A.**



**CROWN and GIANT BRAIDED**

Sash Cord, Bell Cord, Mason's Lines, Clothes Lines.

Picture Wire, Bright Wire Goods.

**OSSAWAN MILLS, Norwich, Conn.**

**WARRANTED.**

We warrant all our **COLUMBIA BICYCLES** to be free from imperfections in material or manufacture and agree to make good, at our factory, at any time within a year, any defects not caused by use, misuse or neglect. We warrant our factory or serial numbers to be correct and that all defective bicycles be returned to us for examination.



BRANCH HOUSES IN WARREN ST. NEW YORK 147 WABASH AVE. CHICAGO FACTORY HARTFORD CONN. CATALOGUE FREE-AT NEAREST AGENCY-OR BY MAIL FOR TWO TWO CENT STAMPS.

**Pope Mfg. Co.**  
221 Columbus Ave.  
Boston, Mass.



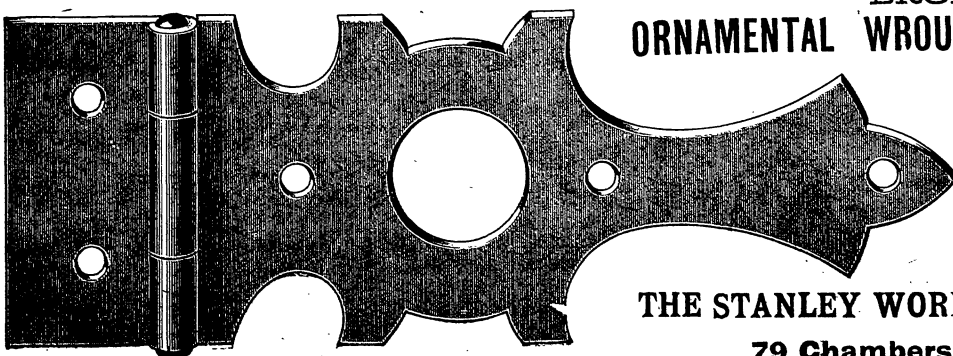
**BRONZED ORNAMENTAL WROUGHT STEEL HINGES,**

— FOR —

**REFRIGERATORS, ETC.**

Samples and prices on application.

**THE STANLEY WORKS, New Britain, Conn.  
79 Chambers St., New York.**



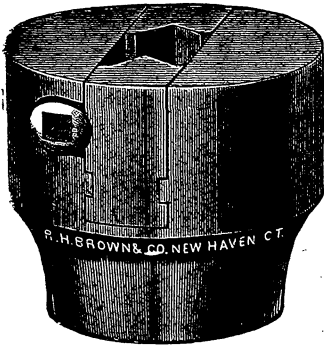
# REID DRILL CHUCKS.

## THREE SIZES.

No. 0 takes any drill from 0 to 1-2 inch inclusive.

No. 1 " " " " 0 " 3-4 " "

No. 2 " " " " 0 " 1 " "



They are the strongest and most durable made. Drill absolutely in the center. No twisting or bending necessary if drill is straight. Can be fitted to hollow spindle lathes for working long rods.

SEND FOR CIRCULAR.

R. H. BROWN & CO., - New Haven, Conn.

You take no risk on the quality  
We make only the best!



**Sand  
Papers**  
IN  
Reams and Roll

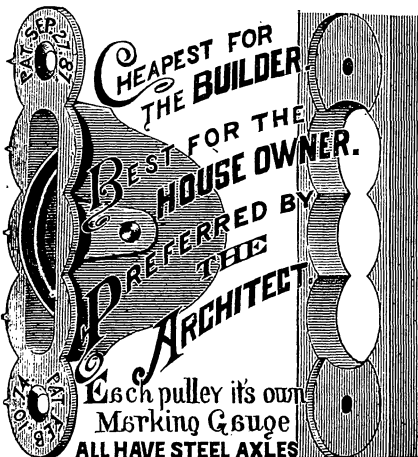
Flint Paper  
Garnet Paper  
Emery Paper  
Emery Cloth

HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

**BAEDER, ADAMSON & Co**

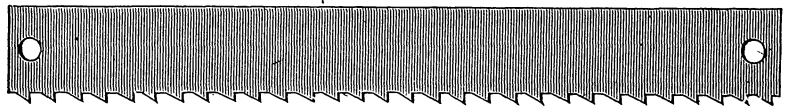
730 MARKET STREET, PHILADELPHIA;  
87 BECKMAN STREET, NEW YORK.  
143 MILK STREET, BOSTON;  
182 LAKE STREET, CHICAGO.

Palmer's Common Sense Frame Pulley.



MANUFACTURED BY

PALMER HARDWARE MFG. CO., Troy, N. Y.



ANY HARDWARE DEALER

in any place can have all the trade in

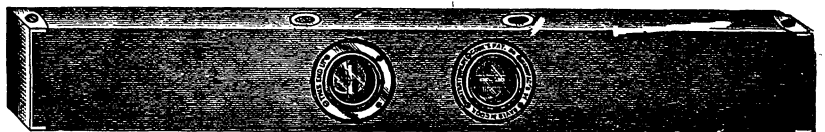
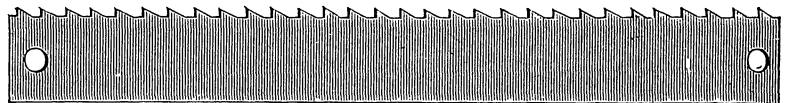
## BUTCHER SAW BLADES

if he will take the trouble to show the Star Blades to the Butchers and permit them to try their quality. There is not a single place where these Blades have been used that they have not taken and held the market. They can be sold for **10 Cents** each, and that is less than the cost of filing a common saw. They are so hard that one will cut three or four times as long as the saws now in use without filing. As these Saws are not to be filed, and as one only lasts a few months before getting dull, a great many of them are wanted. They are listed on the 50th page of our new Catalogue, which we will send on demand.

MILLERS FALLS CO., 93 Reade St., New York.

STAR BUTCHER ★ SAW BLADES.

Length.	Width.	Gauge.	Teeth to Inch.	Per Dozen
14 and 16 in.	$\frac{5}{8}$ in.	24	$9\frac{1}{2}$	\$1.08
18 " 20 "	$\frac{5}{8}$ "	24	$9\frac{1}{2}$	1.20
22 " 24 "	$\frac{5}{8}$ "	24	$9\frac{1}{2}$	1.32



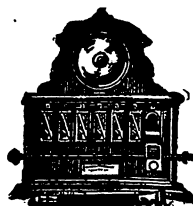
**COOK'S  
PATENT  
LEVEL.**

Made in Wood and Iron. Every Level Fully Guaranteed

Inquire at your nearest hardware store for them. If not in stock, send to

TAKE NO  
OTHER.

**DAVIS & COOK**  
WATERTOWN, N. Y.

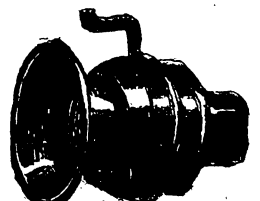


**W. R. OSTRANDER & CO.,**

294 FULTON STREET, NEW YORK,  
Manufacturers of

SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC  
MECHANICAL AND PNEUMATIC ANNUNCIATORS  
AND BELLS.

Complete outfits of Speaking Tubes, Whistles  
Electric, Mechanical and Pneumatic Bells. A full line  
always in stock. Send for new catalogue. Factory,  
DeKalb ave. near Knickerbocker Brooklyn, N. Y.



# CABINET LOCKS

OF EVERY KIND.

DRAWER LOCKS,

CUPBOARD LOCKS,

WARDROBE LOCKS,

CHEST LOCKS

DESK LOCKS.

A complete line of more than 1000 list numbers exclusive of our old  
and complete line of

YALE CABINET LOCKS.

THE YALE &amp; TOWNE M'F'G CO.,

STAMFORD, CONNECTICUT.

New York. Chicago. Philadelphia. Boston. Pittsburgh. San Francisco.

THE DEALER who sells what  
THE PEOPLE ask for

MAKES FRIENDS and MONEY, and  
SAVES TIME and TROUBLE.

The people ask for

## LePage's Liquid Glue,

And the people are right.

It is the strongest and best glue made. It has been  
imitated, but never equalled. Be sure to get what you  
order and ACCEPT NO SUBSTITUTES.

Our name is on every label

RUSSIA CEMENT CO.,

GLOUCESTER, MASS.

New York Office, 95 Reade and 113 Chambers Streets.

Pacific Coast Office, 23 Davis Street, San Francisco, Cal.

## LIGHTNING DRAIN CLEANER.

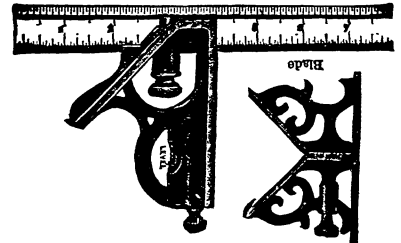
The Drain Cleaner is a hand machine used as a shovel. The dirt pan is made of No. 18 Steel 3 inches deep and 12 inches long, with vertical end in rear. It has a decided advantage over other machines in dipping water and dirt. It is also used for letting down tiling in ditches, which is very convenient and saves extra labor of standing and working in muddy ditches. The iron adjusting rod can be used with great rapidity and ease and can be adjusted to pull or push with as quick a motion as may be desired. To use it in any particular shape tighten the set screw.

For Prices and Discounts, address

BUCKEYE MFG. CO.,

Union City Ind

## CHAPLIN TRY AND CENTRE SQUARE.



Also a full line of

MACHINISTS' FINE TOOLS.

If you haven't our 1893 catalog send us a postal card.

STANDARD TOOL CO.,

ATHOL, MASS., U. S. A.

ATHOL MACHINE CO., Selling Agents.

## NONPAREIL

Ratchet Wrenches.

Made of best forged Tool Steel; are easily and readily adjusted and controlled. Can be made reversible instantly without removing from their work by throwing over the lever in slot of the handle.

The Set of Combination Tools No. 1 includes the wrench, two sockets, one for screw-driver, bit or reamer shank, with wood handle, and one socket



for drill shank and feed nut. The jaws on this wrench open from 3-16 to 1 1/4 inches.

Send for Illustrated Circular and Price-list of various sizes

The Keystone Mfg. Co.  
312 Terrace, Buffalo, N. Y.

## Lamberson's Hardware Price Books

COPYRIGHTED 1885.

LARGE SIZE FOR OFFICE USE.

6x9 1/2 Inches, 500 Pages.

Bound in Leather, Price, \$8.00.

Pocket Edition.

4x7 Inches, 250 Pages.

Bound in Leather, Price, \$4.00.

Sent postpaid on receipt of price by

DAVID WILLIAMS, Publisher &amp; Bookseller,

96-102 Reade St., New York.

# W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

## Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

## DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

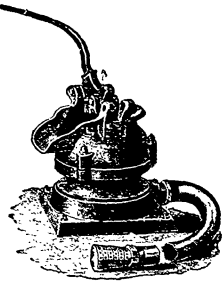
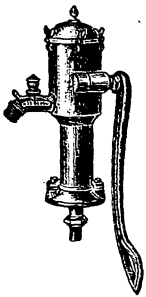
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 209.

Fig. 381.

Fig. 145.



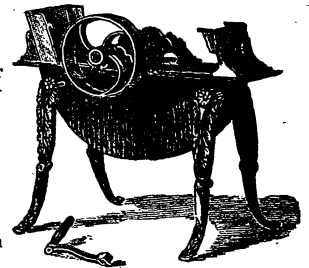
or wherever it is desired to raise a large quantity of water by  
**hand power.**

The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

### CAPACITY

from 3,000 to 4 500 gallons per hour.

These pumps are simple, durable and low priced.  
Made either as shown in cut for Hose or for **IRON** Pipe Suction underneath.

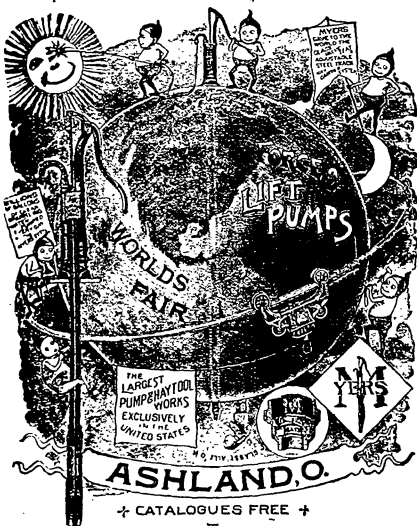


Send for Circular and Price List.

C. I. Grindstone Frame.

**THE DEMING CO.**  
FACTORY SALEM O. U.S.A.  
MANUFACTURERS OF  
HAND & POWER PUMPS, WELL SUPPLIES & C. VERTICAL STEAM PUMPING ENGINES.  
ARTESIAN WELL CYLINDERS, HYDRAULIC RAMS.  
N.Y. OFFICE: 72 JOHN ST.  
NEWTON & HUBBELL  
GEN'L. WESTERN AGT: 55 & 57, N. CLINTON ST.  
CHICAGO, ILL.

## F.E. MYERS & BRO.



Ashland Pump and Hay Tool Works.

The New York Safety Dumb Waiter,  
"The Manhattan Dumb Waiter,"  
The Improved Humphrey Hand Elevator,  
Made specially to be sold by Hardware Stores. Thousands in use. Catalogues on application.  
**THE STORM MANUFACTURING CO.**  
NEWARK, NEW JERSEY.  
Formerly of Poughkeepsie, New York.

## THE BUFFALO DAMPER

SAVES

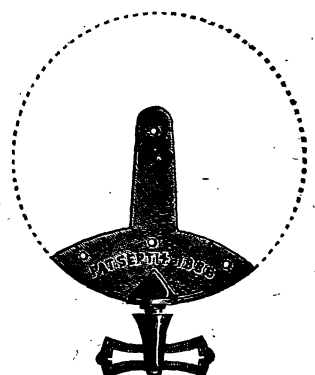
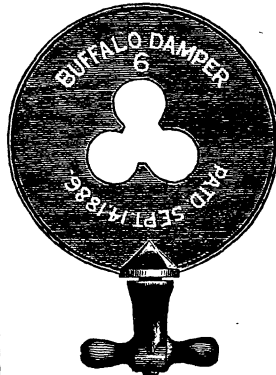
TIME AND TEMPER.

SIMPLE,

SINGLE BEARING,

EASILY PUT IN.

ONLY ONE HOLE IN PIPE.



### THE BUFFALO DAMPER CLIP

Indispensable to Furnace Workers. With it a Perfect Damper of any size may be easily made. Write for prices.

All DAMPERS or DAMPER CLIPS supplied with wood or metal handles, as desired.  
—SOLE MANUFACTURERS,—

SIDNEY SHEPARD & CO.,

Buffalo, N. Y.

C. SIDNEY SHEPARD & CO.,

Chicago, Ill.

Proprietors of the BUFFALO STAMPING WORKS.

SAMPLE ORDERS SOLICITED.

## THE BOSS CORN HUSKERS.



Try them. They cannot be beaten. This cut shows the finest, most complete and effective Husker made. Our E style can be used over a glove. Write for illustrated catalogue.

MANUFACTURED BY

**The Boss Mfg. Co.,**

96 Trade St., - - Kewanee, Ill.



*Manufacture To Order*  
SPECIALTIES & NOVELTIES, PATENTED ARTICLES.  
HARDWARE GOODS ETC., SMALL OR FINE MACHINERY.  
SEND FOR CATALOGUE - CORRESPONDENCE SOLICITED  
**OTTO KONIGSLOW CLEVELAND, O.**

**Lightning Band for Cases and Crates.**

(COVERED BY U. S. LETTERS PATENT.)



Mounted on reels and always ready for use and convenient to handle. Easily and quickly binds shipping cases and crates in a neat, strong and substantial manner.

**PRICES:**

No. 1, per reel of 2000 ft., \$4.50 net.  
No. 2, per reel of 2000 ft., \$4.75 net.

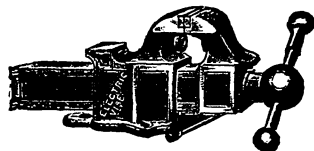
Pliers for cutting wire, 50 cents extra.  
No. 1 for cases under 200 or 400 pounds, and No. 2 for all heavier cases.

Buffalo Specialty Mfg. Co.  
Sole Manufacturers,  
Buffalo N. Y. U. S. A.

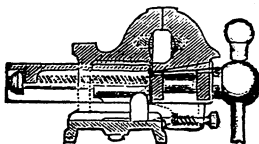
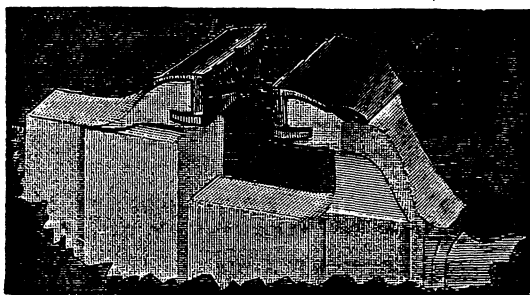
**VISE.**

Patented Dec. 27, 1892.

IT HAS QUALITIES THAT ARE UNDISPUTED.

**Rapid, Active, Prompt.**

One movement in and out, one turn of the hand and the work is secured.

**The Capital Machine Tool Co., AUBURN, N. Y.****BINGHAM PATENT VISE JAW CAP**

Will Fit any Kind of Vise.

For protecting finished work. Will hold finished rods of any shape without injury.

3 1/4 inch..... per pair, 40 cents.  
4 " " " " " 50 "  
4 1/2 " " " " " 60 "

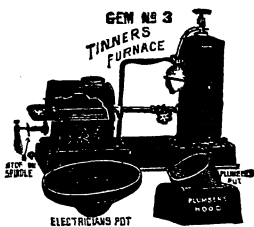
**PRENTISS VISE CO.**

44 Barclay St., New York.

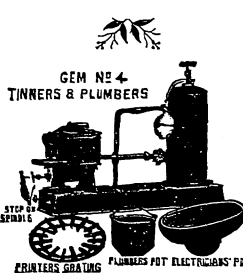
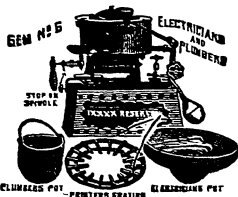
**Burgess Gem Gasoline Furnaces.**

All are equipped with the cylindrical slotted burner. For sale by all first class jobbers, or write us for descriptive circulars.

**BURGESS SOLDERING FURNACE CO.,**  
**J. BURGESS & SONS, Props. and Mfrs.,**  
**Columbus, Ohio.**

**PRICE-LIST:**

No. 3 and 4, Tin Reservoir, \$7.00 ea.  
No. 3 and 4, Copper " 8.50 ea.  
No. 6, IXXX Reservoir, 7.50 ea.  
No. 6, Copper " 9.00 ea.  
Plumbers' Hood for No. 3, 50¢ ea.  
Plumbers' Pot for Nos. 3, 4 and 6, 50¢ ea.  
Electricians' Pot for Nos. 3, 4 and 6, 75¢ ea.  
Printers' Grating for Nos. 4 and 6, 50¢ ea.



All guaranteed to work out of doors or on roofs. Nos. 4 and 6 will melt metal and heat coppers at the same time.

**IRON INSTEAD OF WOOD.****GALVANIZED IRON TUBING and CURB,**

— FOR —  
**CHAIN PUMPS,**  
(Kegler's Patent)

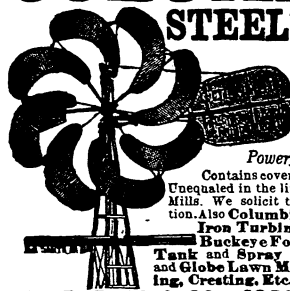
Are Giving Universal Satisfaction,

**BECAUSE:**

They do not rust and accumulate dirt—always clean. Extreme lightness is combined with strength and durability. No freezing. No waste of water by reason of enlarged reservoir at top of tubing. No annoying wheel at bottom. Easy to handle.

Tubing weighs less than 1/2 lb. per ft., is connected by couplings and can be attached to any make of curb.

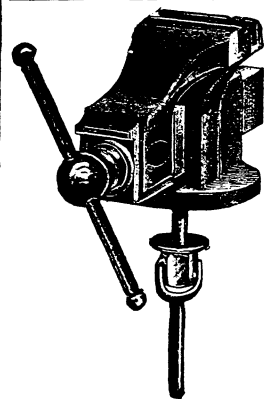
Send for Catalogue.

**Bellevue Pump Co., Bellevue, Iowa****COLUMBIA STEELWIND MILL**

New in Principle.  
Beautiful in Appearance.

Powerful in Operation.

Contains covered Internal Gear. Unequaled in the line of Pumping Wind Mills. We solicit the closest investigation. Also Columbia Steel Derricks, Iron Turbine Wind Engines, Buckeye Force & Lift Pumps, Tank and Spray Pumps, Buckeye and Globe Lawn Mowers, Iron Fencing, Cresting, Etc. Write for circulars.

**MAST, FOOS & CO., SPRINGFIELD, O.****HOLLANDS' OFFSET JAW VISE.**

Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

**Hollands Mfg. Co.,**  
**ERIE, PA.,**  
Manufacturers all styles VISES.

Reliable Torches are  
what you want.



Made either for Oil or  
Gasoline.



These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner.

Write us for prices. A liberal discount given to the trade. Manufactured by  
**THE SCHNEIDER & TRENKAMP CO.,**  
Nos. 479 to 497 Case Ave., Cleveland, Ohio

**AMERICAN BOLT COMPANY,**

Manufacturers of

**BOLTS AND NUTS, COACH OR LAG SCREWS**

Bridge Bolts, Car Bolts, Track Bolts, Washers, Chain Links, BUILDING BOLTS  
AND IRONS OF ALL KINDS, Forgings, Bolt and Nut Machinery, &c.

JAMES MINTER, President.

LOWELL, MASS.

MILES F. BRENNAN, Treas.

K



GEO. N. CLEMSON, Pres.

LOUIS DUHME, Vice-Pres.

ROBERT J. JOHNSON, Treas.

F. B. EARLE, Sec.

## The National Saw Co.,

OPERATING

Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y. Woodrough & McParlin, Cincinnati, O. Woodrough & Clemson, Boston, Mass. Monbagen Steel Works, Middletown, N. Y. Richardson Brothers, Newark, N. J. Harvey W. Peace Co., Brooklyn, N. Y. Pennsylvania Saw Co., Philadelphia, Pa.

GENERAL OFFICE

96 &amp; 98 READE ST.,

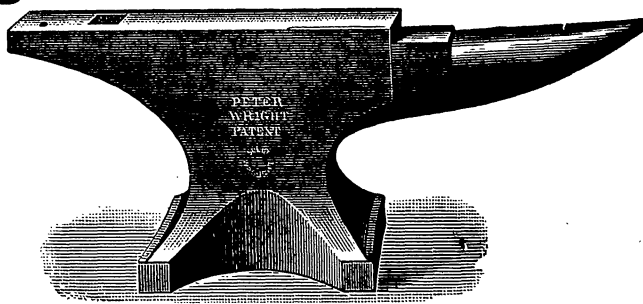
NEW YORK.

SAWS

## Peter Wright's Patent Solid Wrought Anvil

PETER  
WRIGHT  
PATENTSOLID  
WROUGHT

Fac-Simile of Trade-Mark.



Fac-Simile of Green Label.

By Royal Letters Patent,

V. R.

PETER WRIGHT'S  
SOLID WROUGHT  
**ANVIL**  
Made of Best Scrap Iron  
THE BICK FACE AND END ALL  
IN ONE SOLID PIECE!

You are cautioned in buying to see that each anvil is stamped with the full trade-mark on one side and has the green label affixed to the other.

EXHIBIT STAND No. 167,  
GROUP 71.

WORLD'S FAIR.

BRITISH SECTION,  
MACHINERY BUILDING.

PETER WRIGHT &amp; SONS, DUDLEY, ENGLAND.

CIRCULAR, BAND,  
BUTCHER, BUCK

SAWS

MANUFACTURED BY

C. A. HILES &amp; CO.,

336-338 Carroll Ave. CHICAGO

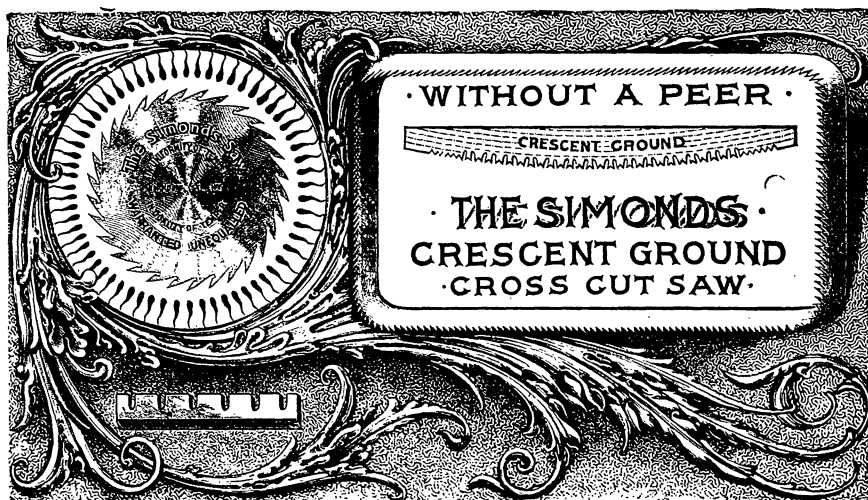
The Sensible  
Saw  
Handle.

HARMON &amp; DIXON, Agts., 118 Chambers St., N. Y.

N. Y. MALLET AND HANDLE  
WORKS.

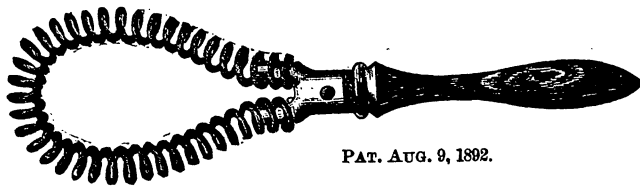
MANUFACTURERS OF  
**MALLETS.**  
Also Cotton and Bale  
Hooks.

Patented Feb. 13, 1877, a new  
combination of Hooks.  
456 E. HOUSTON ST.,  
New York City.



Simonds Mfg. Co. Simonds Saw Co.  
FITCHBURG, MASS. CHICAGO, ILL. SAN FRANCISCO CAL. PORTLAND, ORE.

## THE BOSS DUST BEATER.



PAT. AUG. 9, 1892.

NEAT, DURABLE, AND DOES THE BUSINESS.

For removing dust and filth from Clothing, Upholstered Furniture, Rugs and Carpets it is just the thing. Will raise the nap and so improve the appearance. Will not, like other Dust Beaters, leave marks, nor tear the fabric. The coil is of steel wire secured in a malleable iron socket and attached to an enameled wooden handle. Just what everybody wants.

Retail Price, 25 Cents. Sent by Mail, 35 Cents.

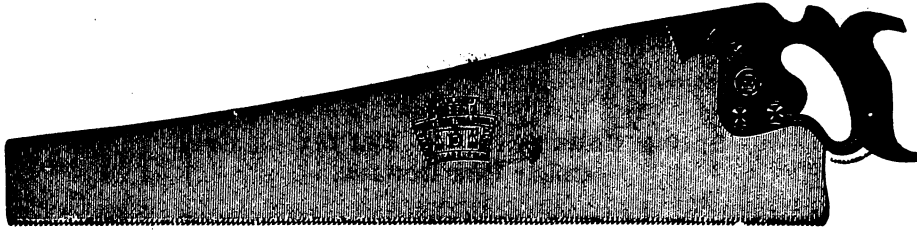
**PEABODY & PARKS,**  
Manufacturers, TROY, N. Y.

"If you want a Saw it is best to get one with a name on it which has a reputation.  
A man who has made a reputation for his goods knows its value as well as its cost and will maintain it."—HENRY DISSTON.

# THE SAWS THAT LEAD THEM ALL

## DISSTON & SONS' PATENT D-8 HAND SAW.

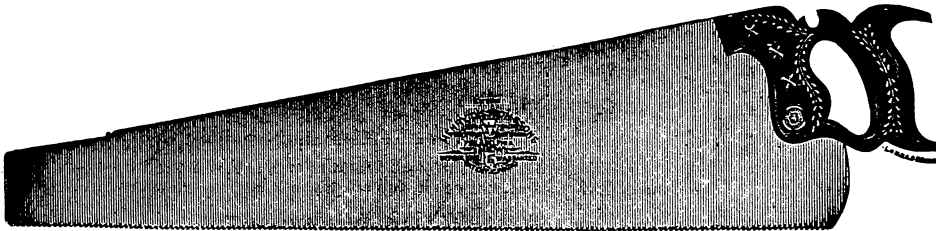
"THE  
SAW;"  
HOW  
TO  
CHOOSE  
IT,  
AND  
HOW  
TO  
KEEP  
IN  
ORDER,  
Sent  
Free  
on  
Receipt  
of  
Name  
and  
Post Office  
Address.



This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

The Saw being let into the handle on a circle, has a perfect bearing, which, with the new screws, makes it stronger and almost impossible to work loose, and avoids the unsightly gap that is seen on the back of the old style handle. All the above features are patented.

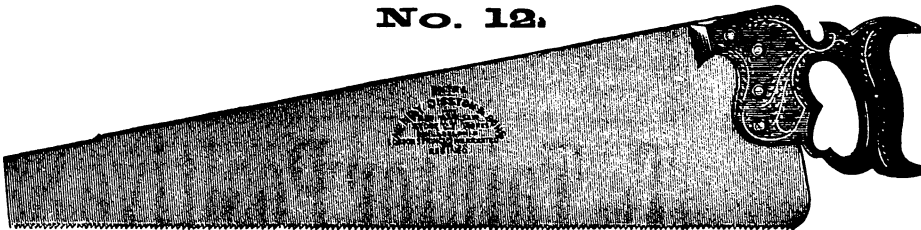
## Our New No. 16 Premium Saw.



### AN EXTRA FINE SAW IN EVERY RESPECT.

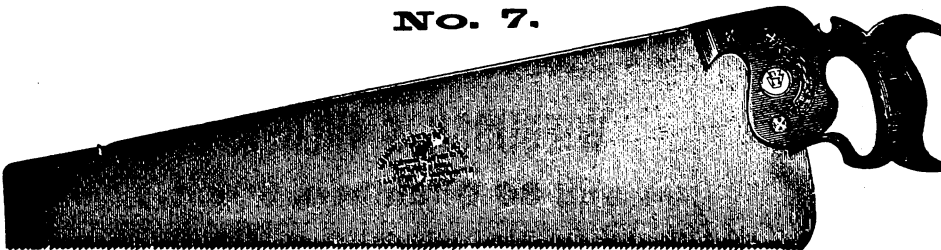
Having the Latest Close up Handle, Spring Steel Blade, Extra Thin Back, Finely Grained, with an Apple Handle and Four Brass Centennial Screws.

### No. 12.



DISSTON & SONS' Extra Refined London Spring Steel, Selected and highly Polished Blade, Handle Carved and Polished, 4 Improved Brass Screws, the finest Hand Saw manufactured.

### No. 7.



DISSTON & SONS' Cast-Steel, Warranted, Beech Handle, Polished Edge, 4 Improved Screws, Grained Blade.

"POCKET  
EDITION  
OF  
THE  
SAWYER"  
and  
"LUMBER-  
MAN'S  
HAND  
BOOK,"  
Sent  
Free  
on  
Receipt  
of  
Name  
and  
Post Office  
Address

ASK YOUR DEALER TO ORDER THEM FOR YOU.

# HENRY DISSTON & SONS

(INCORPORATED),

Keystone Saw, Tool, Steel and File Works, Philadelphia, Pa.

FACTORIES AT  
AKRON, - OHIO.  
SANTON, - OHIO.

**The Whitman & Barnes Mfg. Co.**

FACTORIES AT  
SYRACUSE, - N. Y.  
ST. CATHARINES, ONT.

—MANUFACTURERS OF—



Spring Keys. Spring Cutters. Flat Spring Keys. Flat Riveted Keys.

BRANCHES AT  
79, 85 W. Monroe Street,  
CHICAGO ILL.  
1324 West 11th Street,  
KANSAS CITY, MO.  
126 Main Street,  
CINCINNATI OHIO.

BRANCHES AT  
32 So. Market Street,  
BOSTON, MASS.  
1917 Market Street,  
PHILADELPHIA, PA.  
33 Market Street,  
SAN FRANCISCO, CAL.

NEW YORK OFFICE, 102 CHAMBERS ST.

**NICHOLSON FILE CO.**

PROVIDENCE, R. I.

THE LARGEST AND MOST COMPLETE FILE WORKS IN THE WORLD.

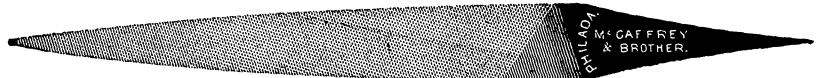
3000 VARIETIES FILES  
[X.F.] AND INCREMENT CUT FILES

Philadelphia, 1876.




**McCaffrey File Co.,**  
FIFTH and BERKS STS.,  
PHILADELPHIA, PA.

For Superiority.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

*Superiority acknowledged wherever used, sold or exhibited.*

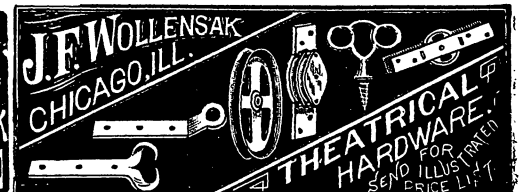
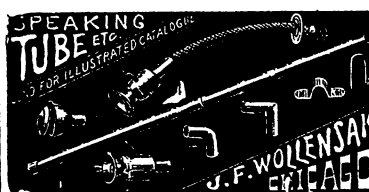
BEST		"TROJAN" HORSE RASPS.		LOWEST	
CRUCIBLE				IN	
STEEL.				PRICE.	
STRONGEST		BANKER & WHITE,		LET	
TOOTH.		(Troy File Works.)		US	
		TROY, N. Y.		QUOTE.	

## The Taintor Positive Saw Set.

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

For Prices and Discounts, address

**WIEBUSCH & HILGER, LTD., SOLE AGENTS,**  
84 and 86 Chambers Street, **NEW YORK.**



**BOOKS.** YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, New York.**



**WM. KROGSRUUD,**  
Engraver and Die Sinker,  
61 Fulton St., N. Y.  
Manufacturer of  
**STEEL STAMPS**  
For Every Purpose.  
Steel Letters and Figures.  
Burning Brands, Stencils  
&c. Send for Illustrated  
Catalogue.



Samuel W. Allerton, Pres.

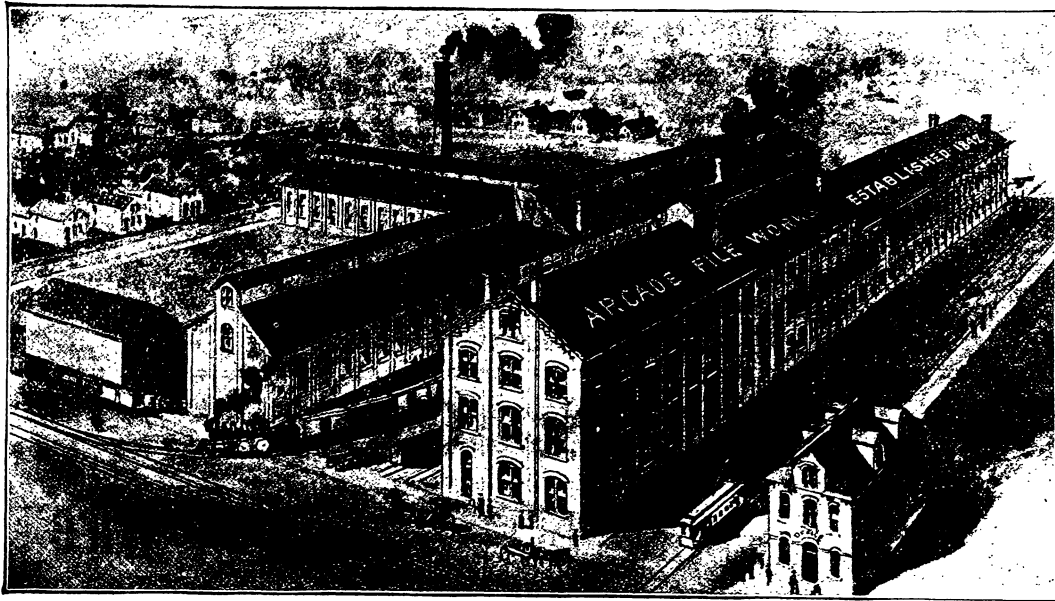
Courtlandt C. Clarke, Sec. and Treas.

Alfred Weed, Vice-Pres. &amp; Gen. Manager.

ARCADE

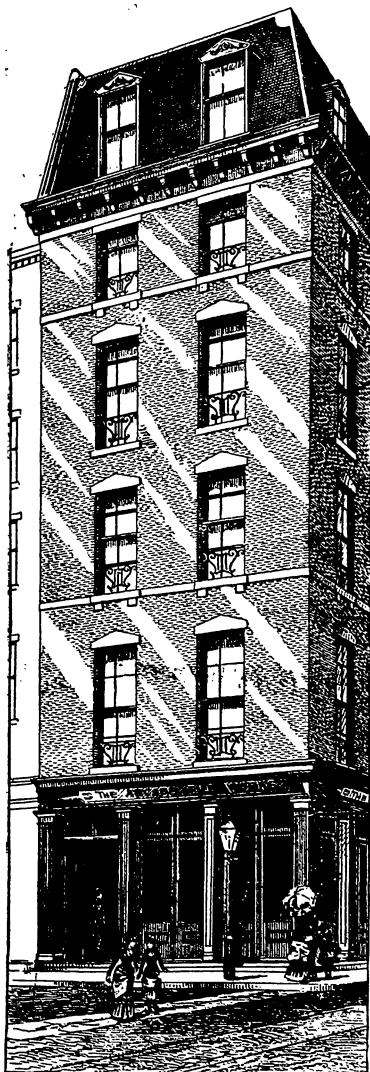
WORKS, ANDERSON, IND.  
ESTABLISHED 1842.

FILE WORKS.



Eastern  
Office and  
Warehouse,  
83 Reade St.,  
New York  
City.

Western  
Office and  
Warehouse,  
23 Lake St.,  
Chicago,  
Ill.



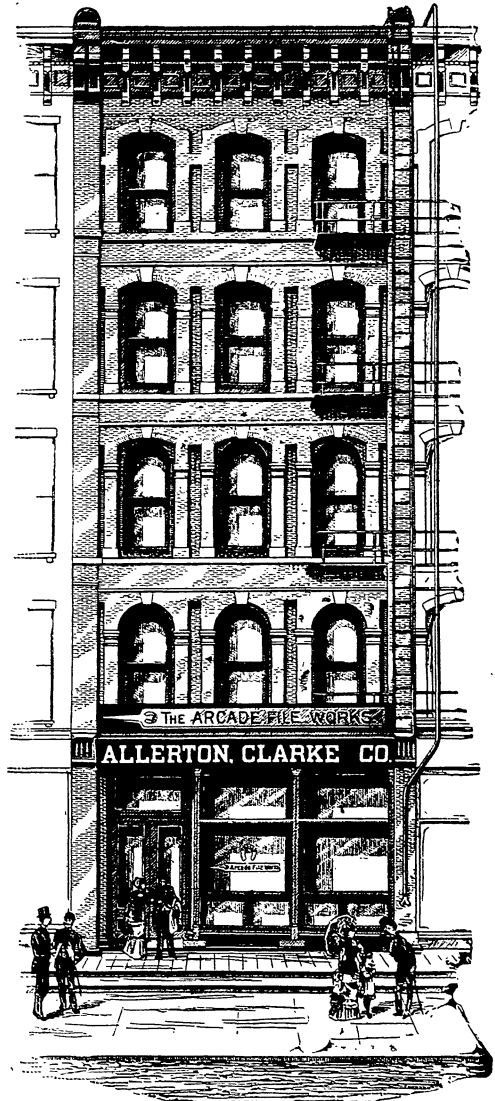
NEW YORK STORE, 83 READE STREET.

**Mr. Alfred Weed**

has joined us in the capacity of Vice-President and General Manager.

THE UNRIVALED GENIUS of this gentleman will be brought to bear in all departments of our factory and we can assuredly say and maintain that we will supply the finest quality of **Files** in the market.

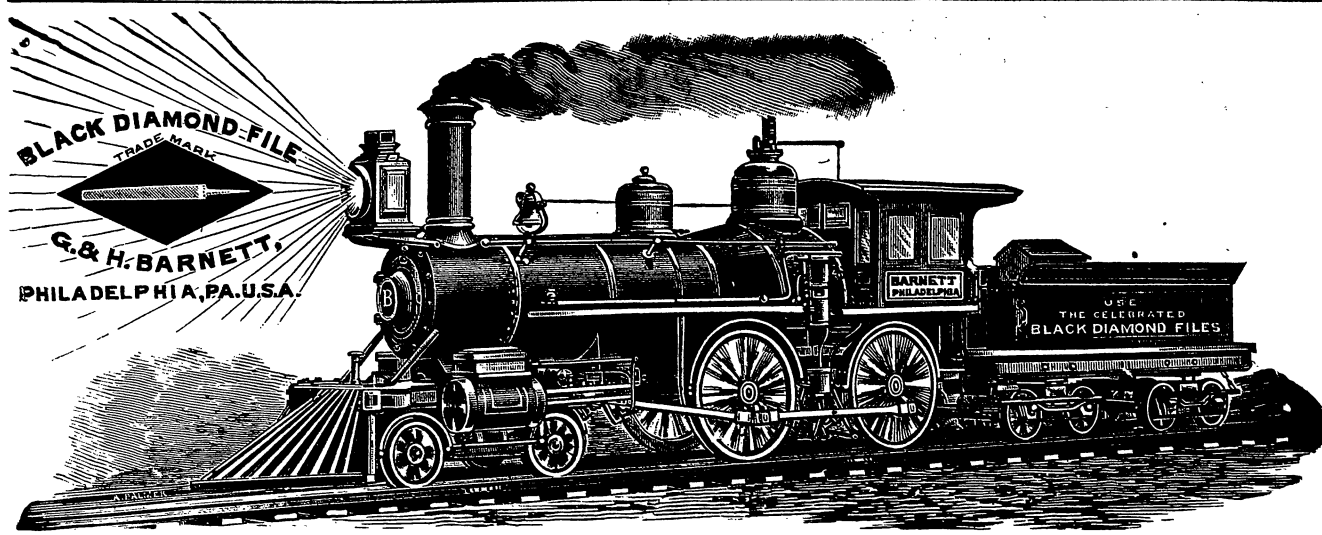
The Fact that we alone use the **even heat** of Natural Gas secures for our Files a temper that makes them superior to all other brands.



CHICAGO STORE, 23 LAKE STREET.

THE OLDEST FILE COMPANY IN THE U. S.  
THE BEST EQUIPPED FILE WORKS IN THE WORLD.

We carry Large Stocks at both of our Warehouses above and can fill all orders promptly



**J. M. KING & CO.,**  
WATERFORD, N. Y.

Manufacturers of  
**BUTTON'S**

**Pat. Wire Cutter  
AND PLIER COMBINED.**

Specially Adapted for Use on Wire Fence.

Also Manufacturers of BLACKSMITHS' and  
MACHINISTS' STOCKS and DIES, PLUG and  
TAPER TAPS, HAND, NUT and SCREW  
TAPS, PIPE TAPS and REAMERS.

Price-List on Application.

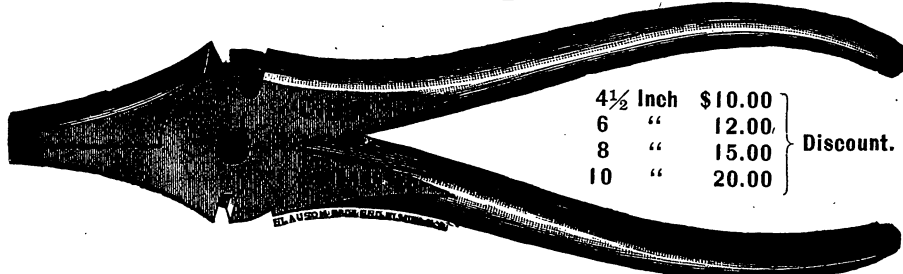
Established by DANIEL B. KING, 1829.

**Cronk's Patent Wire Cutter AND Bender.**

8 In., \$15.00 } Discount, ---  
10 In., 20.00 }

This surpasses any Plier in the market for Cutting and Bending Wire, and can also be used in place of Hill's Hog Ringer. Is especially adapted to farmers' use in building Wire Fence, &c.  
Our reasons for claiming that we have the best Pliers in the market are:  
FIRST.—We use the best Tool Steel and they are nicely finished.  
SECOND.—We combine both Flat and Round-Nosed Pliers in one; the concave and convex circles between the handles are used for bending wire in any desired shape.  
THIRD.—The cupping in the Nose is used for pulling tacks, brads or nails, and can also be used in place of Hill's Hog Ringer.  
FOURTH.—We can cut Barbed Wire, Barb Belt or any kind of Wire used for Fencing purposes. We also claim that we have the only Plier made that the Cutting Jaws cannot be broken.  
By passing the Wire through the Pliers it makes a very handy cut and also holds the Wire after it is cut.

**C. B. P**



4 1/2 Inch \$10.00 } Discount.  
6 " 12.00  
8 " 15.00  
10 " 20.00

What we claim for this plier is that it is made from best quality tool steel and is made heavier and stronger than any plier of its kind in the market and the finish is first-class. Also they are made so the jaws are parallel when used on wire from 9 to 14 gauge and will hold the wire solid.

**CRONK HANGER CO.,** Sole Manufacturers, Elmira, N. Y.

Pacific Coast Agents: CHAS. L. PIERCE & CO., San Francisco, Cal.

**THE CLARK MFG. CO.,**

Blind Hinges, Gate Hinges, Door Butts,

And other HARDWARE SPECIALTIES

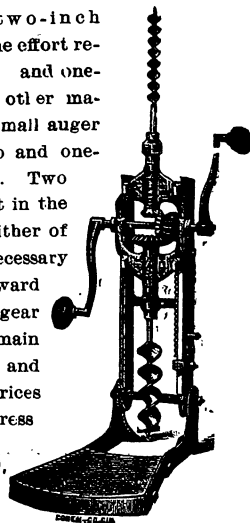
BUFFALO, N. Y.

**The Boss 2-speed Boring Machine.**

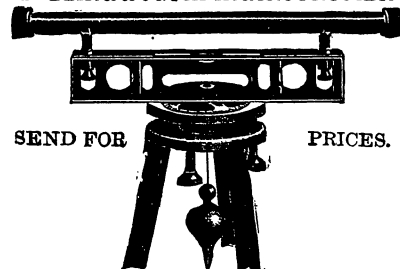
Will operate a two-inch auger with the same effort required in using and one-half inch in any other machine, and for the small auger have a speed two and one-half times faster. Two augers may be kept in the machine, to use either of which it is only necessary to point it downward by first taking the gear frame out of main frame, inverting and replacing it. For prices and discounts address

**Buckeye Mfg. Co.**

Union City, Ind.



**LEVELING & SQUARING INSTRUMENT**

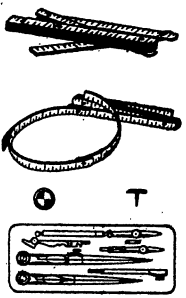


SEND FOR

PRICES.

**C. F. RICHARDSON & SON,**  
ATHOL, MASS.

Manufacturers of Iron Levels and Carpenters, and Architects' Transits.



**KEUFFEL & ESSER CO.** + NEW YORK +  
BRANCH: CHICAGO.  
FACTORIES: HOBOKEN, N.J.

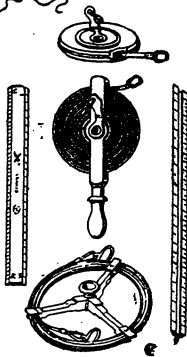
MANUFACTURERS OF EXCELSIOR MEASURING TAPES.  
SUPERIOR QUALITY, LATEST IMPROVED. GREATEST VARIETY.  
STEEL · METALLIC · LINEN · POCKET TAPES.  
EXCELSIOR BAND CHAINS FOR SURVEYORS; LAND CHAINS, &c.

**K & E CO FOLDING POCKET RULES.**

NO WARPING, NO SHRINKING, NO ILLEGIBLE JOINTS, NO BULK.  
2 3.4.5.6.8 FOOT, ALSO WITH PATENT SPRINGS.

FLAT & TRIANGULAR BOXWOOD SCALES, BEST MADE.  
PLUMB BOBS, THUMB TACKS, DRAWING INSTRUMENTS.

PRICE LISTS & QUOTATIONS PROMPTLY SENT.



## HIGHEST GRADE PLATED WARE MADE.

### THE MAJESTIC.

Design Patented August 29th, 1893.

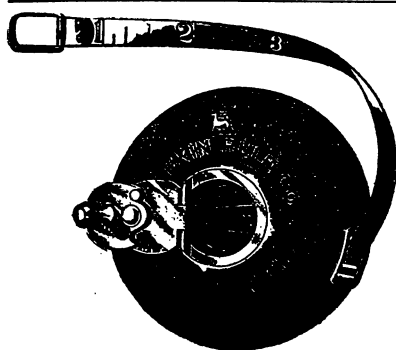


All our goods Sectional Plated on parts most exposed to wear.

#### Branch Offices:

19 Murray St.,  
New York.  
110 & 112 Wabash  
Ave., Chicago.  
722 Chestnut St.,  
Philadelphia.  
133 Charles St.,  
Baltimore.  
120 Sutter St.,  
San Francisco.

The Rogers and Hamilton Co., Factories and Main Office, WATERBURY, CONN.  
FOR SALE BY ALL THE LEADING JOBBERS.



## "RELIABLE" Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.

## LUFKIN RULE CO., Saginaw, Mich.

### Hand Screws

Hand Screw Spindles made of strictly second growth Hickory—never anything else.

### Case's Glue Clamps

All threads cut with a saw to leave the grain solid—a patent process.

### Cabinet Makers' Benches

Nearly 700 of our Benches used by Grand Rapids Furniture makers alone.

WRITE FOR CATALOGUE.

## Grand Rapids Hand Screw Co.

GRAND RAPIDS, MICH.

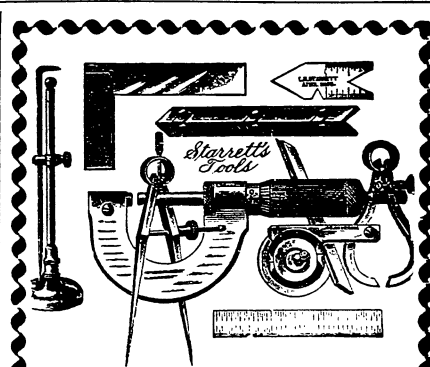
## WARREN AXE AND TOOL WORKS, WARREN, PA., U. S. A.,

Manufacturers of a Superior Quality of

## AXES AND TOOLS,

Including Double and Single Bit Axes, Broad Axes, Hand Axes, Planing Mill Knives, Moulding Knives, Machine Knives of all kinds, Carpenter Adze, Mining Picks and Bark Spuds.

We make **THE SAGER SPECIAL CHEMICAL PROCESS AXE**, only known by us, while others are imitating this axe. None genuine without our label: **SAGER'S SPECIAL CHEMICAL PROCESS AXE.** Write for Prices.



## Skilled Mechanics

want tools that are warranted accurate, best in workmanship, latest in design, finest in finish.

## Live Dealers

want tools they can swear by, not at. That can be relied upon to satisfy intelligent customers. That come nicely put up. That pay a good profit.

## Starrett's Tools

meet the requirements of both.  
SEND FOR CATALOGUE.

L. S. STARRETT

Athol, Mass., U. S. A.

LONDON AGTS: Chas. Churchill & Co. Ltd.,  
21 Cross St., Finsbury, E. C.

**Magical Experiments; or, Science in Play.**  
By ARTHUR GOOD. Translated by CAMDEN CURWEN and ROB WATERS. The experiments explained include some designed merely for recreation, with many really scientific in character. These latter are given with a view of stimulating an interest in the study of physics. 329 pages, illustrated, 8vo, cloth. \$2.00.  
For sale by DAVID WILLIAMS, 96-102 Reade St., N. Y.



TRADE MARK



# John Wilson's Butchers' Knives and Steels, Skinning, Sticking, Farriers' & Shoe Knives,

Have established and maintained their reputation, for superiority,  
against all Competitors, from

**THE YEAR SEVENTEEN HUNDRED & FIFTY,**  
and are still in increasing demand. As in the past, it is the unalterable  
DETERMINATION OF THE HOUSE TO SEND OUT NOTHING BUT WHAT IS OF THE HIGHEST POSSIBLE QUALITY.

WORKS: SYCAMORE STREET, SHEFFIELD, ENGLAND.

SOLE AGENTS FOR THE UNITED STATES, AND THE CANADAS.

Messrs. Hermann Boker & Co., 101 and 103 Duane St., New York.

CORPORATE MARK



## JOSEPH RODGERS & SONS, Limited.

—MANUFACTURERS OF—

Pocket and Table Cutlery, Scissors, Razors, Erasers, &c., &c.

These goods have fully maintained their reputation as the best cutlery in the world for over

**ONE HUNDRED AND FIFTY YEARS.**

Any Infringements of our Name and Corporate Mark will be promptly prosecuted.

Sole Agents for the United States,

**ALFRED FIELD & CO., 93 Chambers and 75 Reade Street, New York.**

Established 1836.

## ALFRED FIELD & CO.

93 Chambers and 75 Reade Streets,

NEW YORK.

IMPORTERS OF

**HARDWARE CUTLERY, GUNS ANVILS,  
CHAINS, FILES.**

SOLE AGENTS FOR

Joseph Rodgers & Sons, Best Cutlery in the world; W. K. & C. Peace, unrivaled Grass Hooks, Straw Knives and Scythes; Joseph Elliot & Sons, Celebrated Razors; Peugeot Frères, "French Toilet" and other Clippers; L. Hugoniot Tissot, Fine Steel Pliers, &c.; Eley Bros., Caps, Wads, Cartridge Cases, &c.; Webster & Horsfall, Steel Wire of every description.

Send for Rodgers' New Illustrated Catalogue

We manufacture all kinds of

## EDGE TOOLS

of highest grade and sell at proper prices.

Send for Illustrated Price-List.

**BUFFALO EDGE TOOL WORKS,** Ridgway, Pa.  
BUFFALO OFFICE, 42 Lewis Block.

— REMEMBER —

WE MAKE ONLY

The Very Highest Grade  
OF  
**MECHANICS' TOOLS.**

**W. H. MAYHEW CO.,** Shelburne Falls, Mass

**A. S. HENN & CO.,**

Manufacturers of

Hardware Specialties, Can Openers, Pocket Wrenches, Mincing Knives, Clothes Line Pulleys, &c.

Send for Catalogue.

**NEW HAVEN, CONN.**

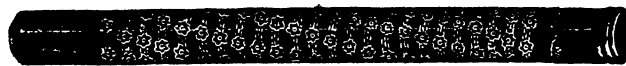


## THE FOX SAFETY RAZOR.

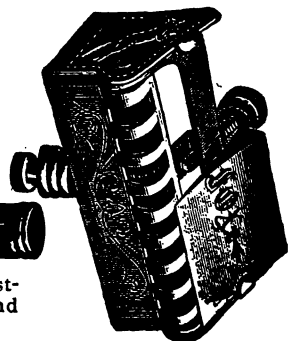
(U. S. Patent 484,116, October 11th, 1892.)

Is the finest and most practical in the world.

**EVERY MAN HIS OWN BARBER.**



Makes shaving a luxury; no danger of cutting. Adjustable blade. Silver plated frames. Sole manufacturer and patentee.



**E. LOTHAR SCHMITZ, 92 Reade St., New York.**

Sold by all the Leading Hardware and Cutlery Houses.

## Underhill, Clinch & Co.,

94 Chambers St., New York.

American Screw Co.'s Screws, Bolts, Rivets, &c.

Oliver Ames & Sons' Shovels.

Germantown Tool Works' Hammers and Hatchets.

Richardson Bros.' Saws.

Branford Lock Works' Locks, &c.

(Yale & Towne Mfg. Co., Lessee.)

**GENERAL HARDWARE.**



**THE TRADE** acknowledges our make of **BUTCHERS' STEELS**  
**THE BEST IN THE WORLD.**

FOR CATALOGUES AND PRICE-LISTS ADDRESS

**C. & A. HOFFMAN, Manufacturers, FRANKFORD, PHILA., PA.**

**J. R. TORREY & CO., Worcester, Mass.**

New York Office: 74 Reade Street.



No. 8 X.

The **TORREY RAZOR STROPS** are known the world over as the standard for excellence in setting a fine edge. We manufacture and carry in stock more than 150 styles.

—Send for Illustrated Catalogue.—

**Cast Shears.**

ACME SHEAR CO.,

BRIDGEPORT, - CONN

**MARTEN DOSCHER,****Commission Hardware,**

88 Chambers St., New York.

Agent—G. W. Bradley's Edge Tools, Axes, Coopers' Tools, Cleavers, Bush Hooks, Draw Knives, Ship-Carpenters' Tools, &c. Also a full stock of Planes, Brooks' Bright Wire Goods, Washita Stone, and Taunton Tack Co.'s Rivets, &c.

**BUCK BROTHERS' EXTRA BUCK BROTHERS,**

MILLBURY, MASS.

The Most Complete Assortment in the U. S. of

Shank, Socket Firmer and Socket Framing Chisels.



TRADE-MARK

CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark also, "Riverlin Works."

**PLANE IRONS.**

Established 1825.

Incorporated 1892.

**R. HEINISCH'S SONS CO.,**

NEWARK, N. J., U. S. A.

New York office, No. 90 Chambers St.

Tailors' Shears, Trimmers, Scissors, Tinnerns' Snips, etc.

CATALOGUES AND PRICES ON APPLICATION.

**WE HAVE NO CONTRACT WITH MESSRS. HERMANN BOKER & CO. AS AGENTS FOR THE SALE OF OUR GOODS.**

HIGHEST AWARD PARIS EXPOSITION, 1889.

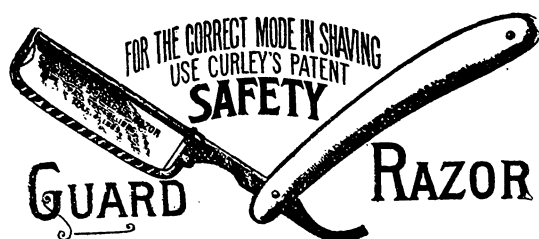
ESTABLISHED 1837.  
INCORPORATED 1892.**THE L. & I. J. WHITE CO.**

BUFFALO, N. Y.

MANUFACTURERS OF

**EDGE TOOLS.**

Coopers', Carpenters' and Ship Tools, Plane Irons, Cleavers, &amp;c. Full Line Chisels.

FOR THE CORRECT MODE IN SHAVING  
USE CURLEY'S PATENT  
**SAFETY**

**THIS** improvement permits CORRECT SHAVING, therefore no irritation is caused, and the most inexperienced can shave with perfect safety.

We also carry the largest line in the United States of CUTLERY of every description.

**J. CURLEY & BROTHER,**

6 WARREN STREET, - - NEW YORK.

**ALASKA.**

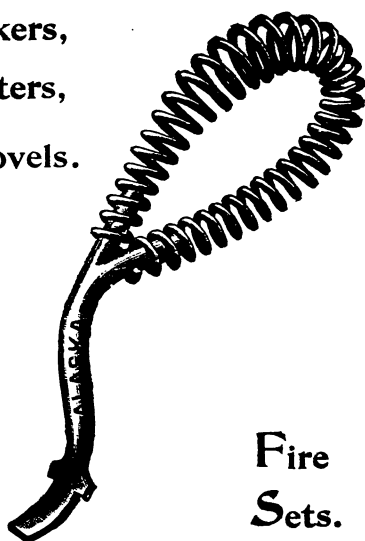
ALWAYS COLD.

Stove Trimmings.

Pokers,

Lifters,

Shovels.

**Fire Sets.**

For Sale by All

First-class Jobbers in Hardware.

Made under Gaitly Patents and only by

**Troy Nickel Works,**

TROY, N. Y.

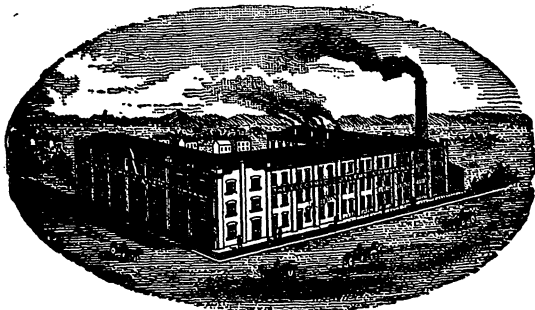
FRANCIS FROST & CO., Toronto, Ont.  
Canadian Sales Agents.**WHEN IN WANT OF WOSTENHOLM'S****I★XL****Knives or Razors,**

SEND TO

**FRED. B. GURNEY**

116 Chambers St., N. Y.

# The Best Equipped Cutlery Works in the World.



FACTORY: FOURTH &amp; DICKERSON STS. NEWARK, N. J.

## THE ELECTRIC CUTLERY CO.,

113 Chambers St., N. Y., and Newark, N. J.

Manufacturers of Razors, Knives  
Razor Stropps, Scissors and Shears

(SEND FOR CATALOGUES.)

## NORTHAMPTON CUTLERY COMPANY, NORTHAMPTON, MASS.

NEW YORK

SALESROOM,

TABLE CUTLERY, BUTCHERS' CARVERS, PLATED GOODS, &amp;c.

122 Chambers

Street.

MANUFACTURERS OF

Send for Revised Catalogue.



**W. & S. BUTCHER, Sheffield, England,** and 135 Duane St., New York  
Makers for over *One Hundred Years* of the celebrated "*W. Butcher*" Files and  
Edge Tools and "*Wade & Butcher*" Razors, and the Original Manufacturers of Hollow  
Ground Razors, can with confidence highly  
recommend their goods and particularly their



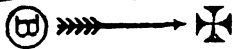
Brand as being the most perfect *Extra Hollow Ground*  
Razors ever manufactured and especially suited for the use of  
Barbers and for private use. Genuine Razors are marked with  
one of the following Corporate Trade-Marks:

WADE & BUTCHER  
SHEFFIELD, ENGLAND

OR



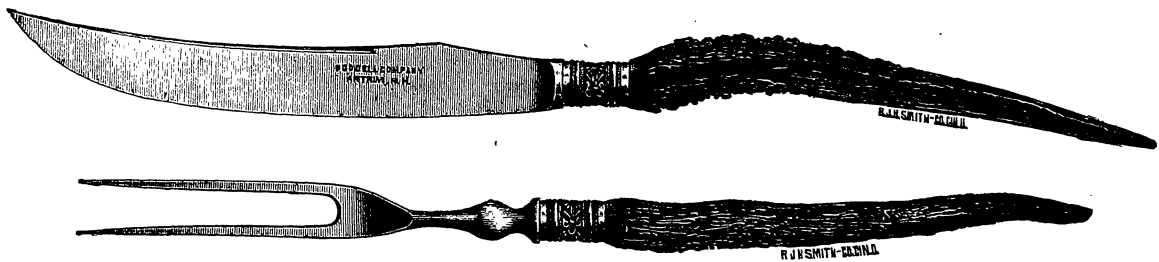
OR



FOR SALE BY ALL DEALERS IN HARDWARE, CUTLERY AND FANCY GOODS.

## HOW IS YOUR STOCK OF CARVERS.

We make a specialty of Carving Knives that will take and hold an edge.



Most any man will pay a fair price for a pair of Carvers, but he wants good ones. Buy Goodell's and you can give him what he wants, make a profit and expect further trade. We can give you Wood, Bone, Stag, Im. Stag, Rubber and Celluloid handles, with blades of various shapes and sizes; also Table Knives, Butcher, Boning, Sticking, Skinning, Hunting, Bread, Cheese, Kitchen, Putty, Cigar and Shoe Knives. Butter Spades, Butcher Steels, &c., &c.

**BEST IN THE WORLD. Catalogue Free to Dealers.**

## GOODSELL COMPANY, ANTRIM, N. H.

AGENTS:

ALFORD &amp; BERKELE CO., 77 Chambers St., N. Y.

HENRY KEIDEL &amp; CO., Baltimore, Md.

## FAYETTE R. PLUMB,

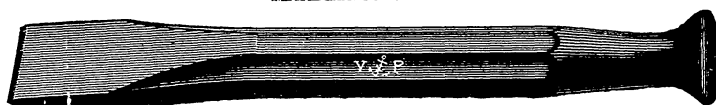
Edge Tools,  
Hammers

AND

Sledges.

Penna. R. R., Tucker and James Sts.

Manufacturer of



Main Office and Works

Railroad,  
Miners'

AND

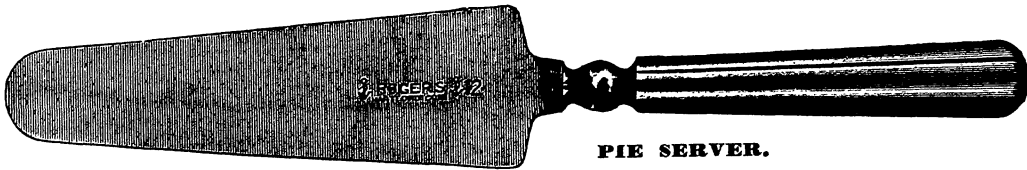
B. S. Tools.

Philadelphia Pa., U. S. A

**—NONE BETTER—**  
 THAN THE



# SILVER PLATED WARE.



**PIE SERVER.**

MANUFACTURED BY

## THE W.M. ROGERS MFG. Co.,

Office and Factory, HARTFORD, CONN. P. O. Drawer 30.

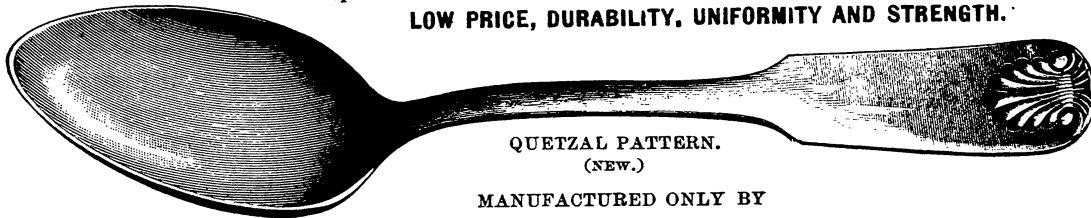
NEW CATALOGUE FOR THE ASKING.

## AZTEC COIN METAL

MADE INTO SPOONS AND FORKS.

Spoons and Forks of this metal combine all the following desirable features:

**LOW PRICE, DURABILITY, UNIFORMITY AND STRENGTH.**



QUETZAL PATTERN.  
(NEW.)

MANUFACTURED ONLY BY

THE HOLMES & EDWARDS SILVER CO.,

Bridgeport, Conn.



**The Bridgeport Chain Co.'s Triumph**

Chain, made into Halters  
Traces, Cow Ties, Tie-

outs, Kennel Chains, &c.; also cut to lengths for manufacturers' use.

**The cut represents the exact size of 6/0.**

Thirteen Sizes made, 6/0 being the Largest.

**FACTORY AT  
BRIDGEPORT, CONN.**

**"SHUT DOWN!"** What's the Matter?"

**"BELT BROKE AGAIN!"**

"See here, Mr. Foreman, if you don't have fewer stoppages I'll——"  
 "Stop, Mr. Proprietor, the fault is yours. Quit buying belts that crack, peel, open at between plies, stretch and break, and I'll give you a smooth run. You think it economy to buy cheap belts from Worthless & Co. Why! the time lost and trouble and annoyance caused by shut-downs would pay the difference between good and bad belts ten times over. Why don't you buy Cleveland's 'Shield High Grade,' sold by Reliable & Co.? It has an established reputation, has been thoroughly tested, and is in use in all the large mills and elevators here. You take no chances on it. Besides, a strong warrantee is indelibly branded upon it, such as no manufacturer would dare put on a poor belt. You remember that threshing machineman, whose engine we repaired, said he had a Cleveland High Grade Belt in use over five years, and if it will stand such severe work, it certainly will ours."



Trade

Mark.

LABEL INDELIBLY STAMPED ON  
EVERY 30 FEET OF BELT.

We are the only manufacturers who indelibly stamp a warrantee on each and every belt (see copy of label) and it remains as long as the belt lasts; and who give a written guarantee (see fac-simile). Our threshing machine belts have made a wonderful record, and our endless belts have given splendid service, the splice being as strong as the solid part of the belt. Suction Hose for Portable Engines and all other purposes.

**We Want Your Trade.**  
 Send for 60-page Catalog.  
 Write for Prices and Samples.

**CLEVELAND RUBBER WORKS**

OF THE MECHANICAL RUBBER CO., CLEVELAND, OHIO.

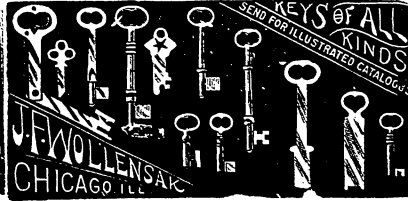
### GUARANTEE.

We Guarantee our "Shield High Grade" Belt to be made of best long staple, 30 & 32-oz. cotton duck; To be the most durable, because it is made of best materials, by special machinery; To be the best selling belt, because it has the best reputation, a cleaner record of long service, and because its warrantee is stronger, bolder, broader than any other, and is irrevocable, protecting both dealer and consumer. We further guarantee that, should any belt, under fair and reasonable service, fail or give out from any defect in material or manufacture, to replace same free of charge, on return to us.

Witness our hand and seal.

**Cleveland Rubber Works**

Of the Mechanical Rubber Co.



**THE KNAPP & COWLES MFG. CO.,  
BRIDGEPORT, CONN.**

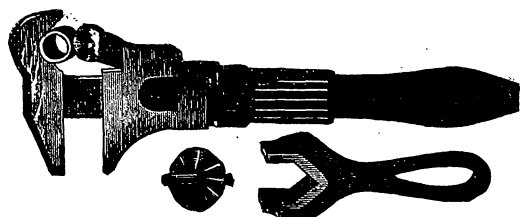
Makers of a large line of  
STANDARD

Hardware Specialties.

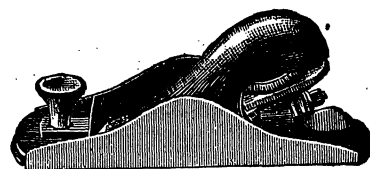
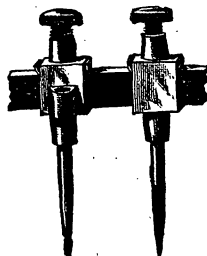
SEND FOR  
K Catalogue.



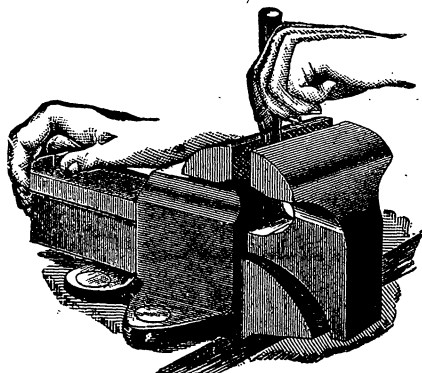
# HIGH QUALITY TOOLS



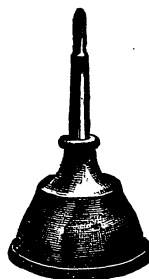
Donohue's Pat. Engineers' Wrenches,  
Short or Long Sleeve Nuts, and  
with Pipe Cutter.



Chaplin's Patent Iron Planes,  
Corrugated Bottoms,  
Checked Rubber  
Handles.



Stephens' Patent Vises, Quick Adjust-  
ing Cam and Toggle-Joint, Sta-  
tionary or Swivel Base.



Challenge Iron Planes.  
Simplicity of Construction.

Boardman's Pat. Wrenches, Excelsior Expansion Bits, Whitney Drills, Baxter's Wrenches,  
Wood's Pat. Plumb and Levels, Devoe's Square Attachments, Gem Wrenches,  
Malleable Oilers and Lamps, Pencil Attachments.

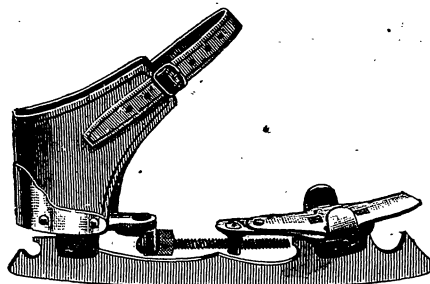
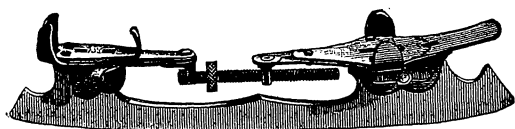
**TOWER & LYON, Manufacturers, - - 95 Chambers St., New York.**

# ICE SKATES

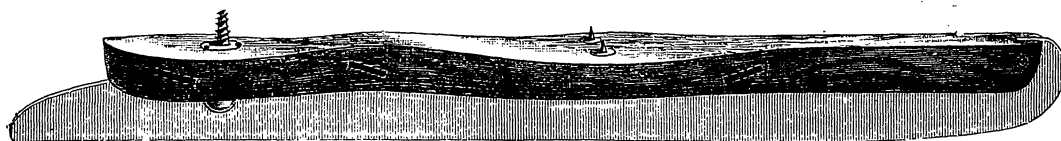
—MANUFACTURED BY—

**THE UNION HARDWARE CO.,**

**Torrington, Conn.**



**DONOGHUE RACING SKATE.**

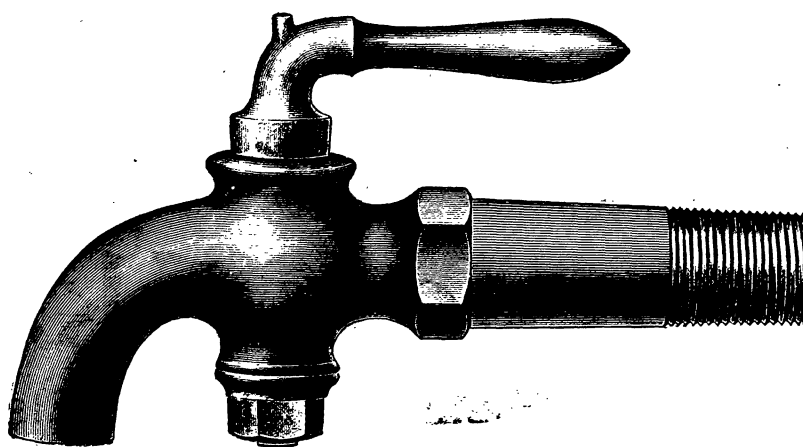


**SUPERIOR QUALITY, STYLE AND FINISH.**

—NEW YORK OFFICE:—

**TOWER & LYON. - - - - 95 Chambers Street.**

# Standard Petroleum Oil Faucets.



These Faucets are made from the best Refined Iron, with Solid Brass Key, and are fully warranted. The bearing is longer than in the ordinary faucet, making them less liable to break. Made in following sizes.

	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{5}{8}$ in.	$\frac{3}{4}$ in.	1 in.
SCREW SHANK,	No. 13	No. 14	No. 5	No. 6	No. 7
TINNED "	No. 013	No. 014	No. 05	No. 06	No. 07
LIST,	\$6.75	\$8.25	\$9.00	\$10.50	\$12.00 per Dozen.

Write to us for Discounts, we can interest you.

**JOHN H. GRAHAM & CO., SOLE AGENTS,**  
113 CHAMBERS ST., NEW YORK.

P. O. BOX 1042.

## A Triumph in Small Bore Rifles. STEVENS' "FAVORITE" RIFLE.



10 SHOTS AT 40 FEET. 10 SHOTS AT 40 FEET. 10 SHOTS AT 40 FEET.

25 STEVENS

MADE FOR THE 22 OR 25 RIM FIRE CARTRIDGE.

WEIGHT, 4 $\frac{3}{4}$  POUNDS.

22-INCH BARREL.  
LEVER ACTION LIKE SHARPS.  
TAKEN APART IN TEN SECONDS.

IT IS SIMPLY IMPOSSIBLE  
TO MAKE MORE  
ACCURATE SHOOTING BARRELS  
THAN ARE ON THIS RIFLE.

RIFLE  
TAKEN APART.

No. 17. Plain Open Sights.....\$12.50  
No. 18. Vernier, Open Back, and Beach Front Sights..... 17.00  
No. 19. Lyman Peep, Open Back, and Lyman Front Sights, 17.00

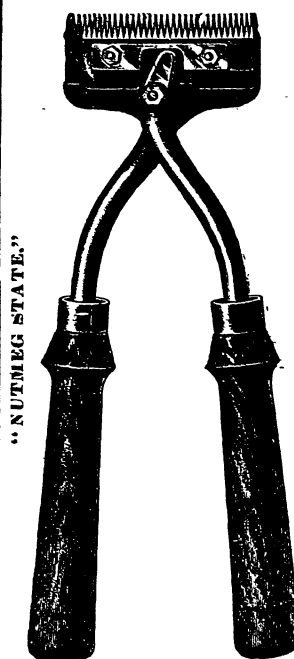
A 60 Page Catalog showing our full line of Fire Arms with TRADE PRICE LIST sent with pleasure to all dealers.

**J. Stevens Arms & Tool Co.,**

P. O. Box 5729.

Chicopee Falls, Mass. U. S. A.

**Edward S. Hotchkiss,**  
MANUFACTURER OF HARDWARE,  
BRIDGEPORT, CONN.



SATISFACTORY PRICES. Standard goods. Don't fail to write when in want of Horse and Barber's Clippers, No. 20 Steel Rat Killers, Curry Combs, Metal and Wood Choker Mouse Traps Lemon Squeezers, Baxter Pattern Wrenches, &c., &c.

**AMERICAN TOOL COMPANY,**  
NEW YORK,  
MANUFACTURERS OF  
**TOOL CHESTS**

Of all sizes, complete with tools, for Hardware, Toy, Notion and Variety trades.

200 West Houston Street, near Varick.  
Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.



# DAME, STODDARD & KENDALL,

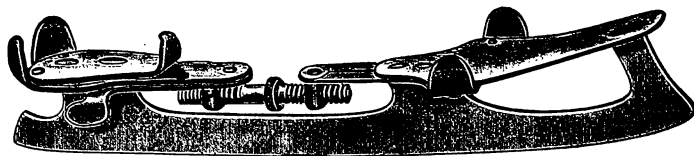
IMPORTERS AND WHOLESALERS,

374 Washington St., Boston, Mass.

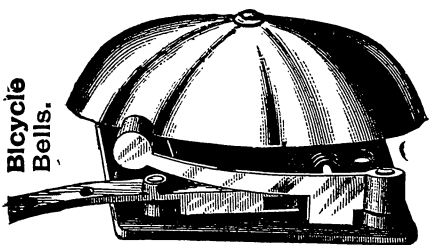
## Headquarters for Winslow Skates.

Obtain our Prices before Ordering Elsewhere.  
1893-94 Catalogue Now Ready.

The SAMUEL WINSLOW SKATE MFG. CO., Worcester, Mass., U.S.A.



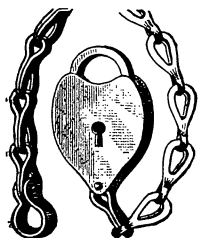
The most extensive Skate Factory in the World.



Bicycle  
Bells.

BEVIN BROS. MFG. CO., Easthampton, Conn.  
Manufacturers of

Sleigh Bells, House Tea, Hand, Gong Bells, &c.



Bicycle Locks.  
Bicycle Bells.

Especially Low Prices

We manufacture  
hardware specialties  
of all descriptions to  
order.

HAINES & ZIMMERMANN, 407 Cherry St., Phila.

Diamond  Cycle Wrench  
with Spoke Grip Attachment



Lightest, Neatest and  
Strongest.

ALL STEEL DROP FORGED, CASE HARDENED.  
Weight, 5½ oz., Length, 4¼", Adjustment, 1¼"  
MANUFACTURED BY THE

GENDRON IRON WHEEL CO  
TOLEDO, O. Sold by all Cycle and Hardware  
Dealers.

## SICKELS, SWEET & LYON,

Wholesale Hardware.

Office, 35 Barclay St. Warehouse, 40 Park Place, New York.

N. Y. AGENTS FOR

WINSLOW SKATES.

Eagle Files.

Union Steel Screw Co.'s Screws.

Orders for Skates should be placed early. Shipments from factory or  
New York as preferred.

Fall Catalogue No. 6 Issued September 1st.

SICKELS, PRESTON & NUTTING CO.,

Wholesale Hardware and Tinnery's Stock.

N. Y. Office as above.

DAVENPORT, IOWA.

OUR  
AMERICAN  
And Safety Hammer

Double Action in 32, 38 & 44 Cal.

H. & R. Imp. Ejecting Double Action,

H. & R. Imp. Automatic Double Action,  
In 32 and 38 Caliber.

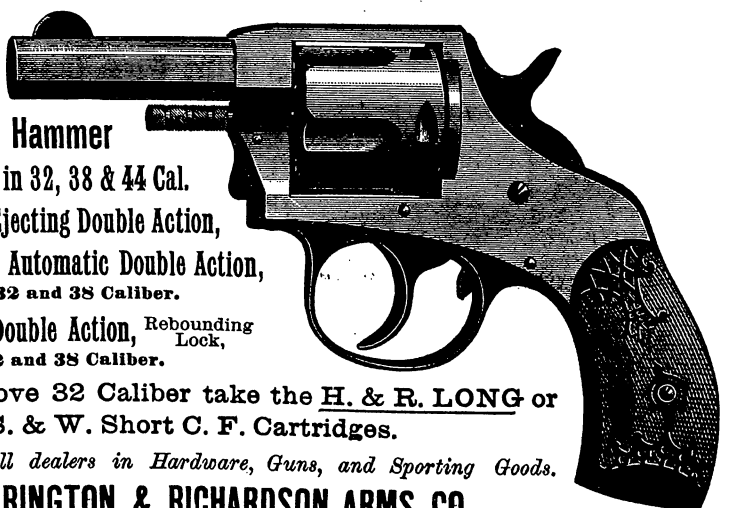
And Premier Double Action, Rebounding  
Lock,  
In 32 and 38 Caliber.

All the above 32 Caliber take the H. & R. LONG or  
S. & W. Short C. F. Cartridges.

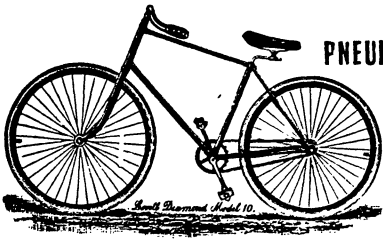
For Sale by all dealers in Hardware, Guns, and Sporting Goods.

HARRINGTON & RICHARDSON ARMS CO.,

Worcester, Mass., U.S.A.



# Lovell Diamond Cycles



**HIGHEST GRADE.**  
PNEUMATIC, CUSHION AND SOLID TIRES.  
FOR LADIES AND GENTLEMEN.

MANUFACTURED BY  
**John P. Lovell Arms Co.**  
BOSTON, MASS.  
CYCLE CATALOGUE FREE.

**WESTERN WHEEL WORKS.**

**BICYCLE**



**MANF'TRS**

From \$20

to \$135.

**MOST COMPLETE LINE MADE.**

OFFICE AND FACTORY:

Wells, Schiller and Sigel Sts., and N. Park Ave., Chicago, Ill., U.S.A.

## A Wheel



Properly Designed,  
Practically Made,  
Combining Strength,  
Durability and  
Perfect Qualifications.  
Such are the

S  
O  
L  
D  
SIGHT.

## Dauntless

**FALCON JUNIOR**, for Boys.

**FALCON JUNIOR COMBINATION**,  
for Boys and Girls.

The only high grade juvenile wheels made. Full ball bearings, perfectly dust proof, 1½ in. pneumatic tire, 24 in. wheels, graceful drop handle bars, combination cork and rubber handles.

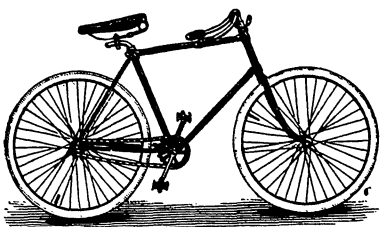
The bearings are turned out of solid bar steel, and all material and workmanship are first-class. Made in the same manner, of the same stock, with the same care as the large wheels. Good juvenile wheels are scarce, and ours are going rapidly.

The W. Bingham Company, CLEVELAND, OHIO.

**THE ONLY STANDARD BICYCLE**

In the World at a Moderate Price is the

# W A V E R L E Y .



IT IS THE ONLY MACHINE that is and will remain at a standard medium price in America. Every W A V E R L E Y sold this year brought \$100.00. They are still bringing \$100.00 while other makes reduced from \$150.00 will not sell beside them at \$85.00. Sell W A V E R L E Y S and make a profit. Sold direct to retailers Catalogue and terms.

Indiana Bicycle Co., - Indianapolis, Ind., U. S. A

## Yacht AND Boat Hardware.

**L. W. FERDINAND & CO.,**

BOSTON, MASS.  
Send for 212-Page Catalogue.



**To Make a Bull's Eye**

In Your Business or at the Range?

If you deal in ARMS or AMMUNITION or shoot a Rifle, Pistol or Shot Gun, you will make a HIT by sending for the IDEAL HAND BOOK.

IDEAL MFG. CO., New Haven, Ct., U. S. A.

Please mention *The Iron Age* when you write.

The Henry C. Hart Mfg. Co.,  
DETROIT, MICH.,

MANUFACTURERS OF

**HARDWARE SPECIALTIES,  
Toy Banks, Etc.**

B  
I  
G  
G  
E  
S  
T



B  
E  
S  
T

JUNIOR Retails for . . . 25 cts.  
NATIONAL Retails for . . . 50 cts.  
IMPERIAL Retails for . . . \$1.00

The Largest Combination Lock Banks for  
the Money on the Market.

20 OTHER STYLES.

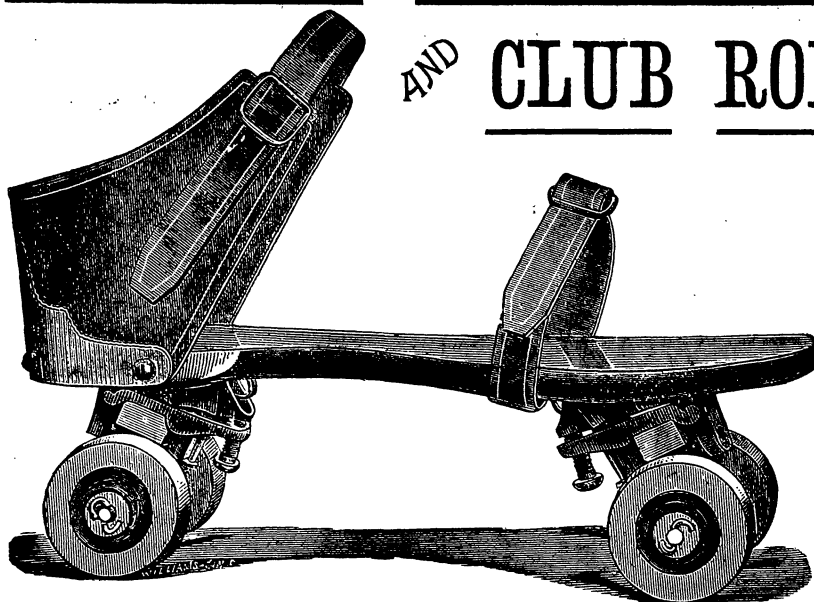
SEND FOR CATALOGUE.

IF YOU WANT THE BEST  
BRITANNIA SPOONS  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840.

IF YOU WANT THE BEST  
NICKEL SILVER SPOONS  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840.

IF YOU WANT THE BEST  
SILVER PLATED SPOONS  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840.

# HENLEY'S CELEBRATED RINK AND CLUB ROLLER SKATES.



A full, new and complete stock of Roller Skates, Skate Repairs and Rink Supplies. Address for 80 page catalogue and prices,

**M. C. Henley,**

RICHMOND, IND.

## THE O. L. CO.'S ::



Entire line should be run this year. Their Tubulars seem to catch customers just right, and then the price, you know, that's the thing. The Surprise Tubular is the greatest lantern in the world. Made only by

**Ohio Lantern Co.,**

TIFFIN, OHIO.

**W. W. PRYOR & CO.,**

81 Chambers St., New York, Eastern Agents.

A full line of samples can be seen and the trade supplied at factory prices.



SURPRISE TUBULAR.

This GUN has rebounding locks and the barrels can be taken off and put on again without cocking the arm, and when cocked the hammers may be let down gradually, and without the full force of the blow. It is simple in construction, having very many less pieces than any other hammerless gun.

Easily Tipped and Cocked,  
Damascus Barrels,  
Handsomely Engraved,  
French Walnut Stock.

SEND FOR DESCRIPTIVE  
CATALOGUE.



**New Hammerless Double Gun,**

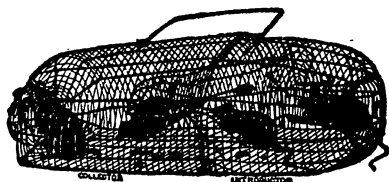
MANUFACTURED BY

**FOREHAND ARMS CO.**

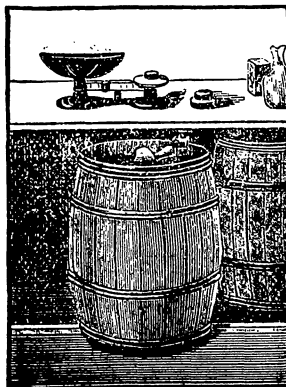
Worcester, Mass.

PRICE VERY LOW.

GENUINE **MARTY** RAT AND  
ALWAYS IN STOCK. MOUSE  
TRAPS



THEY DO THE WORK.  
Orders solicited. Prices on application.  
**BURDITT & WILLIAMS,**  
20 Dock Square, Boston, Mass.  
—SOLE AGENTS AND IMPORTERS.—



**Wonder Somebody Didn't  
THINK OF IT BEFORE!**

**The Perfection Barrel Swing.**

A simple device, readily attached to any Pantry, Cupboard, Broad Shelf or under the counter in a Grocery or Hardware Store, for swinging a barrel to get at the contents easily. Price, \$1. All Hardware dealers will supply them.

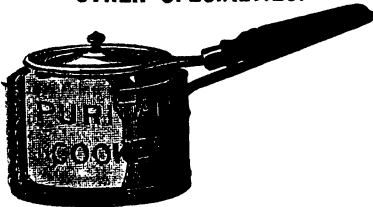
MANUFACTURED BY

**THE LEAVITT MACHINE CO.**

ORANGE, MASS.

## "PURITAN"

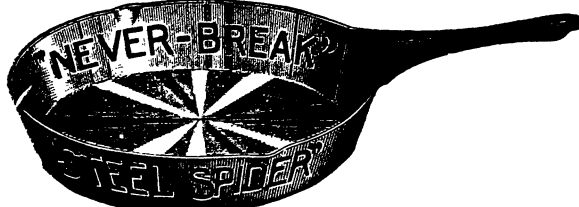
COOKERS, COFFEE POTS AND  
OTHER SPECIALTIES.



Cooks Quicker than any other  
Porcelain Rice Boiler made.

## "NEVER-BREAK"

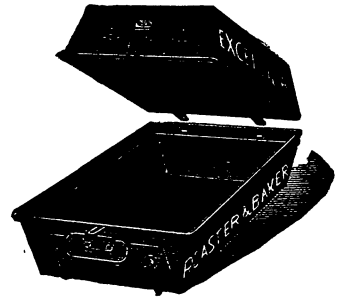
Wrought Steel Spiders  
Wrought Steel Griddles, Kettles, Stew Pans, Stew Pots, Maslins,  
Scotch Bows, Hotel Sauce Pans, &c.  
MIRROR POLISHED—TINNED—PORCELAINED.



"MIRROR POLISH," the only Perfect Plain Steel Finish  
SOLE MANUFACTURERS

## "EXCELSIOR"

Roasting and Baking Pan.  
PLANISHED and PLAIN STEEL.



THE BRONSON SUPPLY COMPANY,  
CLEVELAND AND NEW YORK.



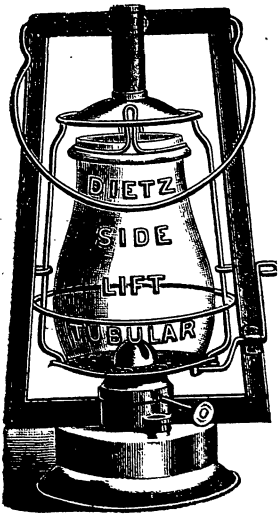
No. 3

Globe Street Lamp.

## Light your Streets and Driveways. The S. G. & L. CO. Tubular Globe Street Lamp

IS THE Best Street Lamp Manufactured.  
Equal to the best Gas Light.  
Will not Blow Out in the Strongest Wind.  
Will not Smoke.  
Will not Freeze.  
Automatic Extinguisher.  
Outside Wick Regulator.  
Will Burn Four Hours for One Cent.

MANUFACTURED BY  
STEAM GAUGE AND LANTERN CO.,  
SYRACUSE, N. Y.  
Western Branch, 25 Lake St., Chicago, Ill.



ESTABLISHED 1840.

## A WORD TO THE WISE.

When you purchase a Lantern, Street  
Lamp or Driving Lamp, remember the

## "DIETZ" Make

is the best. Our goods have stood the test of time  
and are safe and reliable. The name "DIETZ" is  
plainly stamped on them. Our specialty is 'Tubular  
Lanterns, Street Lamps and Driving Lamps  
We make a large variety, being the oldest and largest  
house in our line.

ASK FOR THEM!

R. E. DIETZ COMPANY,

New York, 60 Laight St. U. S. A. Chicago, 25 Lake St.

## Break it Down!!!

—IF YOU CAN.—



BRADLEY  
STEEL  
SHELF  
BRACKETS } ARE { STRONG,  
LIGHT,  
ARTISTIC,  
PROFITABLE.

THEY ARE GREAT SELLERS.

"I have NEVER HAD A CALL for  
this bracket," a certain dealer once said  
to us.

His competitor was taking good care  
that he should not.

You want "TO BE IN IT" this fall.  
Let us send you our catalogue and prices.

ATLAS MFG. CO., New Haven, Conn.  
SOLE MANUFACTURERS.

PAT. NOV. 8,  
1892.

## SHEETS, COOKING UTENSILS, MEDALS,

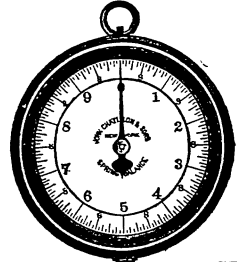
Sheets and Rivets for Boats  
and Coffins.

Bars for Horse Shoes.

ILLINOIS PURE ALUMINUM CO.,  
LEMONT, ILLINOIS.

## John Chatillon & Sons,

85, 87, 89, 91, 93 CLIFF ST., NEW YORK.

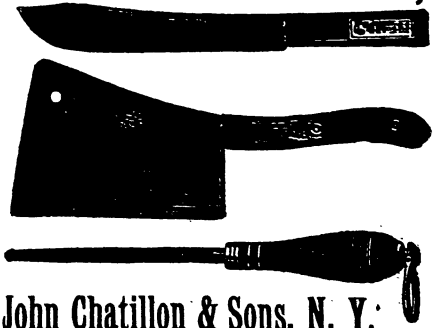


ESTABLISHED  
1835.

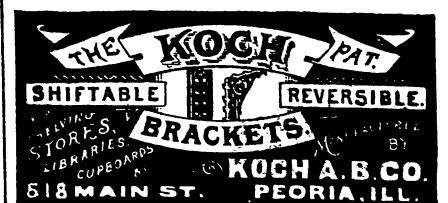
SEND FOR  
PRICE LIST.



MANUFACTURERS  
OF  
SCALES  
—AND—  
BUTCHER TOOLS.  
SOLE AGENTS FOR  
Foster Bro.'s Butchers' Cutlery.

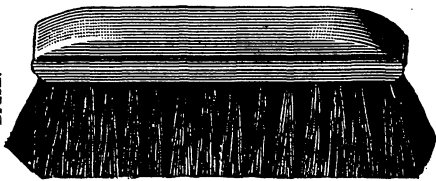


John Chatillon & Sons, N. Y.



**JOS. LAY & CO.****RIDGEVILLE,  
INDIANA,**

No. 8 Soft Molders' Brush.



— MANUFACTURERS OF —

No. 10 Hard Molders' Brush.

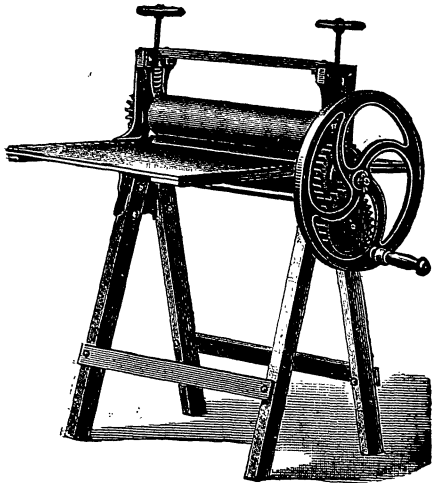
Hard and Soft Molders' Brushes, Steel Wire Casting Brushes, Stable, Shop, Street, Boat and Carpet Brushes, Brooms and Brushes of all kinds.

**HIGH GRADE.****LOW PRICED.****The Family Mangle.**

WARRANTED TO DO  
Better Work than Hand-work.

**SAVES** all the fuel,  
two-thirds the work.  
Keeps the linen whiter.

We Guarantee Every Machine.



Send for descriptive circular to  
**S. C. Johnson, Racine, Wis.**  
Agents Wanted.

BUSINESS ESTABLISHED  
1798.INCORPORATED  
1891.**JOS. F. McCOY CO.**

26 Warren St., New York,

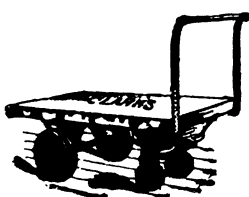
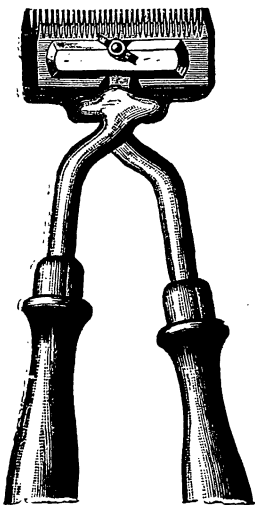
Headquarters for

**Coates' Horse Clipper**

AND  
**Barber  
Clippers.**

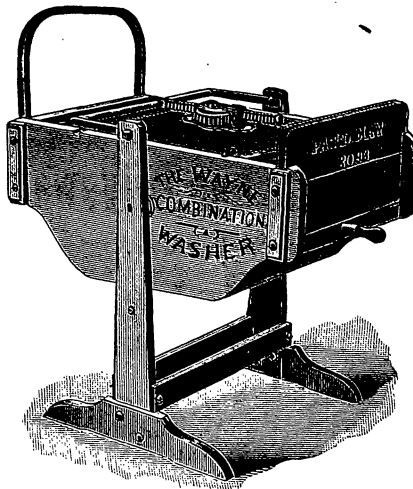
ALSO  
THE "BELL"  
AND  
THE "COMET"  
Horse  
Clippers.

At prices to suit  
the times.



**TRUCKS** of all  
kinds. Mounted  
on rubber or  
iron wheels. Trucks  
made to order.  
Write for prices  
Catalogues free.

G. P. CLARK, Box O.  
Windsor Locks Conn

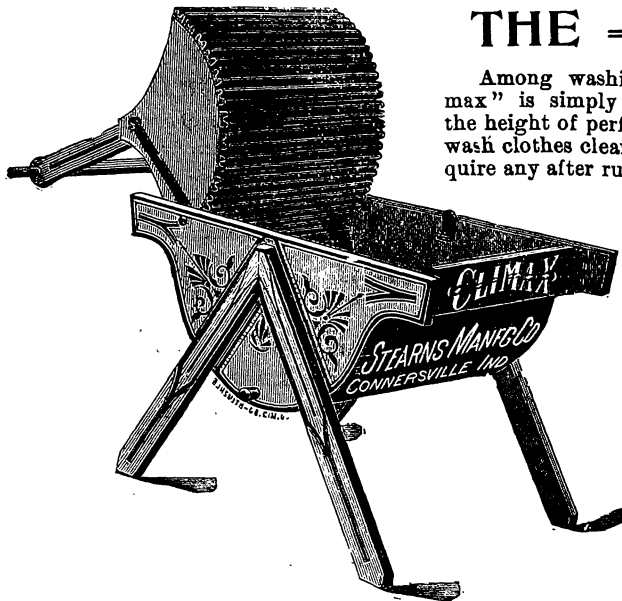
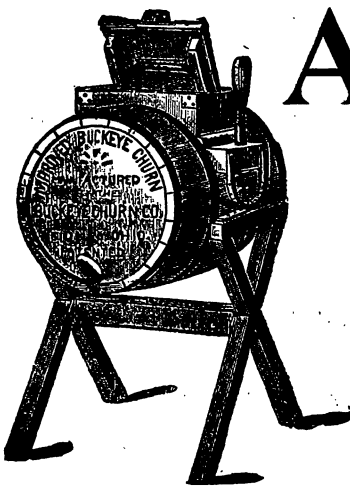
**TO BE SAFE**

In the kind of Washing Machine you want to handle, we say examine our latest production, the "Anthony Wayne Combination." It's the only washer that has all bad features eliminated and that embodies all the good ones. It washes clean, first, last and all the time, with the least labor. To handle it is to sell it. Particulars about it and our others free. Write.

**SEND FOR SAMPLE.****THE ANTHONY WAYNE MFG. CO., - FORT WAYNE, IND.****THE - CLIMAX.**

Among washing machines "The Climax" is simply what its name implies, the height of perfection. It will not only wash clothes clean, but they do not require any after rubbing, and does it without tearing. Its points of excellence are so many that space will not permit of repetition. Dealers who desire profits and the good will of their customers are alive to its merits. Are you? If not write

—THE—  
**STEARNS MFG. CO.**  
CONNERSVILLE, IND.,  
Manufacturers of  
CLIMAX WASHER, CLIMAX  
WOOD and CHAIN PUMPS &c.

**A Buckeye**

Churn is the best for making butter quick, cleanly and rapidly. There are others, but none its equal. A child delights in operating it. Order a sample. See if it doesn't sell quick. Our Queen Washing Machine is another excellent household adjunct, cheap but good. Agencies given. Write

**BUCKEYE CHURN COMPANY,**  
**SIDNEY, OHIO.**

**ENTERPRISE LAWN SPRINKLER**

No. 1, \$3.50; No. 2, \$2.75.

Indispensable  
to a well kept  
Lawn.

A Sprinkler  
which will work  
satisfactorily in  
spite of muddy  
water.

May be easily  
moved from  
place to place  
without going  
near it

SOLD BY ALL  
HARDWARE DEALERS.

SEND FOR CATALOGUE.

THE ENTERPRISE MFG. CO., of PA., 3d and Dauphin Sts., Philadelphia. Branch Office, with J. C. McCarty & Co., 97 Chambers Street, N. Y.

**ADVANTAGES:**

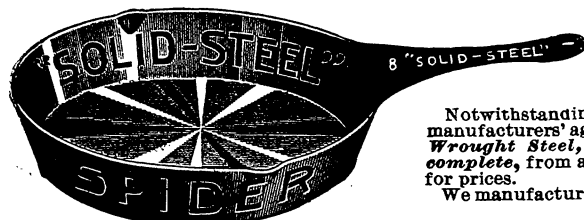
1st. Each machine is furnished with a cord or rope, so that the Sprinkler may be easily moved, when running, without going near it.

2d. The water passes through a strainer before it enters the small perforations, which are thereby prevented from filling up.

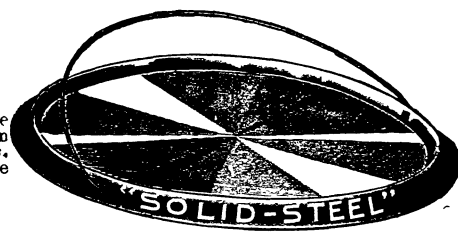
3d. It is so constructed that the weight of its revolving parts is removed by the pressure of the water, thus overcoming unnecessary wear.

4th. All parts of the machine are made sufficiently strong for ordinarily rough usage and are interchangeable.

5th. The machine is TINNED and NICKEL PLATED and is of very handsome appearance.

**"SOLID-STEEL" SEAMLESS HOLLOW WARE.****BRILLIANT FINISH.**

Notwithstanding the claims made by some manufacturers' agents, our spiders are made from *Wrought Steel, Without Seams or Rivets, complete, from a single piece of metal.* Write for prices.  
We manufacture our own goods.



No Seams, no Rivets in "Solid-Steel" Ware.

Made either with Balls or Solid Handles.

**The Cleveland Stamping & Tool Co., Cleveland, O.**

**We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.**

# The Original Hunter Sifters



Are made unlike any other, and of course are superior to any others. They can be imitated to be sure, but then—oh! well, what's the use of talking, you are not getting what you pay for.

—ADDRESS—

**The FRED J. MEYERS MFG. CO.,**  
**COVINGTON, KY.**

F. J. MATTISON, Eastern Agent,  
NEW YORK.

**GRAY FRUIT PICKER.**

Picks Apples Pears, Plums and all small fruit. A necessity in every orchard. Have them in stock.

**GRAY..**  
**..FRUIT PICKER.**

WRITE FOR SAMPLE AND PRICES.

**THE CLEVELAND NOVELTY CO., - Cleveland, Ohio.**

## JACKETED KETTLES HOLLOWARE.

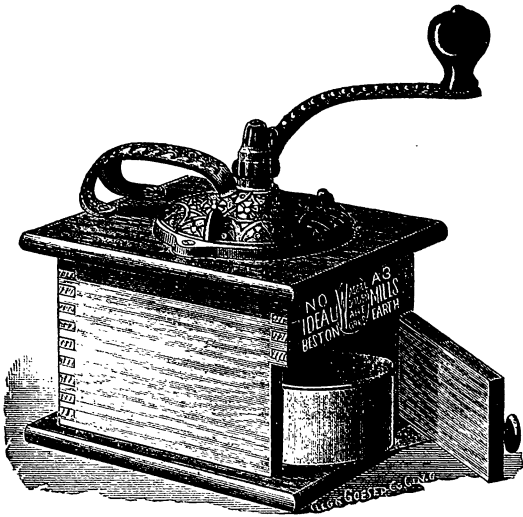
**THE STUART & PETERSON CO.,**  
Philadelphia, Pa., and Burlington, N. J.

**THE QUEEN ANNE SCREEN CO.,**  
Burlington, Vt.,

MANUFACTURERS OF  
*Improved Adjustable Window Screens.*  
THE QUEEN ANNE. With box panels; the only screen made and finished alike on both sides.  
THE EUREKA. The best cheap extension screen on the market.  
SCREEN DOORS. Finished all ready to hang Sticks, Corners, Improved Frames, &c.  
Write for circular and Price-list.



# "BIG W. W. W. W. FOUR."



A certain company are claiming to be "sole manufacturers of Waddel's Coffee Mills," ("If you see it in the sun its so"). The statement is designed to mislead the trade. The old line of Waddel's Coffee Mills, which have been on the market the past five years, are not manufactured by us. We are making a new line of Coffee Mills which are guaranteed to grind twice as fast as similar goods, and each mill is labeled under a trade-mark "Ideal Coffee Mills manufactured by Waddel Wooden Ware Works; best on earth." Specify the new goods and order "Ideal Mills," and our word for it, you will not make a mistake. Address plainly

**Waddel Wooden Ware Works or "4 W."**

Greenfield, Ohio.

MANUFACTURERS OF

**CASH REGISTERS, MONEY DRAWERS, COFFEE MILLS, RAT TRAPS and NOVELTIES.**



## Make No Mistake

When you want a "NEFF" Washer buy it. When you think you want some other make examine Neff's first and if you don't think it's the best, we'll give it to you. But if you want to do business write for prices, that's the best way: saves money and time.

**W. H. NEFF, - - COWAN, IND.**

## The Sun Manufacturing Co.,

Successors to the Jno. M. Waddel Mfg. Co.,

ARE SOLE OWNERS AND MANUFACTURERS OF

**Waddel's Improved Coffee Mills,  
Cathedral Gong Money Drawer and Surprise Rat Traps.**

Beware of Infringements.—We will protect our Patents.

**"THE 'SUN' ONLY, SHINES FOR ALL."**

A New Name, A New Reputation,

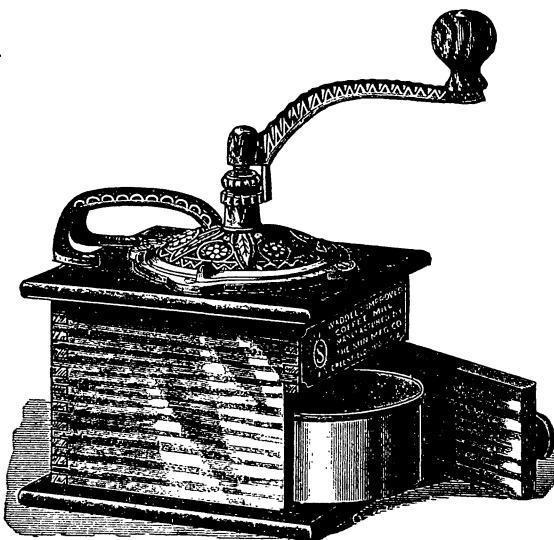
**A New Line of Coffee Mills**

That under the SUN Brand shine as leaders.

**RAPID GRINDERS that will STAND THE WEAR.**

**STEEL ALLOY BUHRS,**

A metal of recent discovery for this purpose used solely and only by the SUN. Warranted to outwear, outgrind and outsell any Coffee Mill ever put on the market.



**We Challenge a Competing Test for Rapid Grinding and Wearing Surface.**

Our New Line bears the Sun Trade Mark and is labeled Steel Alloy Buhrs.

Write for Our Catalogue and New Prices.

Order a Sample Mill.

**THE SUN MANUFACTURING CO.,**

Greenfield, - Ohio, U. S. A.,

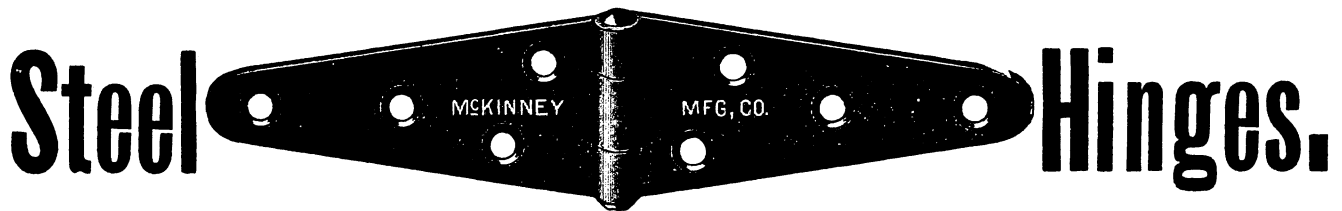
MANUFACTURERS OF

Cash Registers, Money Drawers, Coffee Mills and Wooden Ware Specialties.

# WE CLAIM

That one pair of our Celebrated Steel Hinges will outwear two pair of the Flimsy Invention now being forced upon the attention of the trade.

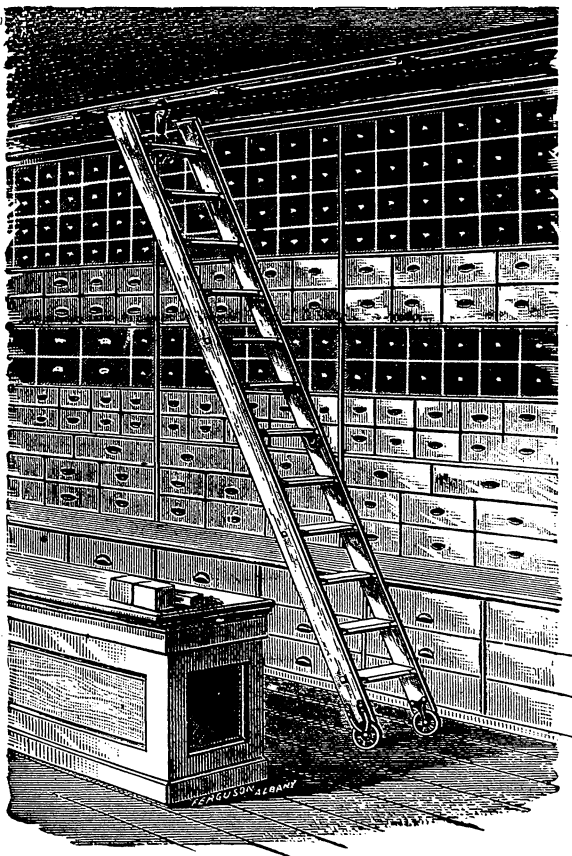
## McKINNEY MFG. CO., ALLEGHENY, PA.



SEND FOR LIST.

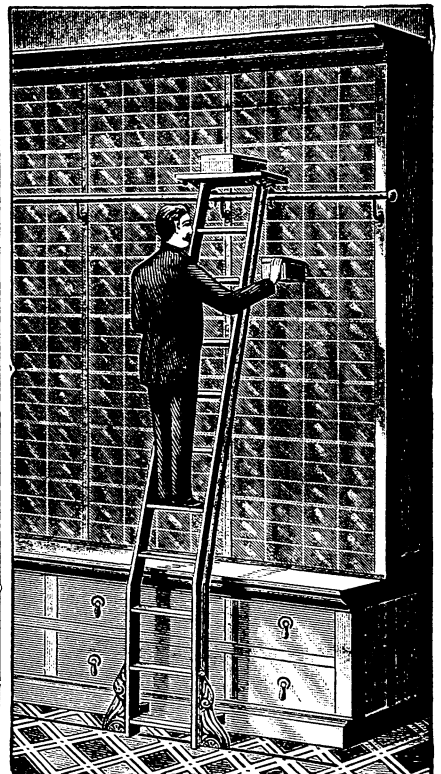
"NONE BETTER."

## THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by  
**M. CROISSANT,**  
ALBANY, N. Y.



FLOOR TRACK BICYCLE LADDER.

No other Ladder Service can approach the "Bicycle" in ease and convenience of operation. Compared with others they work like a bicycle beside a lumber wagon.

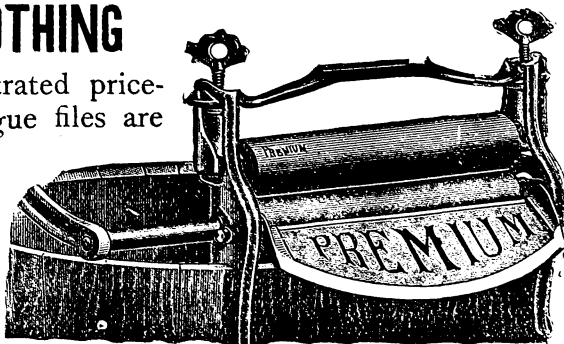
Can be applied to any kind of shelving made. See this space next week for other styles.

Send for Illustrated Catalogue and prices to

**THE BICYCLE STEP LADDER CO.,**  
50 State street, Chicago, Ill.

## IT COSTS NOTHING

to send for our illustrated price-list, and your catalogue files are incomplete without it. Write to the Factory, Montpelier, Vt., or to our Chicago store, 68 Lake St.



**COLBY WRINGER COMPANY.**

**BOOKS.** YOU CAN OBTAIN PROMPTLY the latest work on any subject in which you are interested by addressing **DAVID WILLIAMS,** Publisher and Bookseller, 96-102 Reade Street, New York.

## HARDWARE DEALERS

CAN RECOMMEND THE

## CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for Sash Cords, very strong and lasting (some in daily use ten years), and gives thorough satisfaction wherever used. The patented attachments are very simple and can be applied to any window.

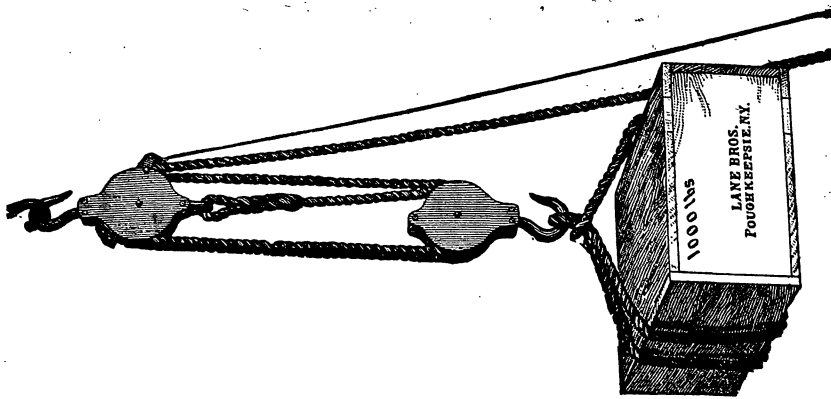
MANUFACTURED ONLY BY

**"THOMAS MORTON,"**

65 Elizabeth Street,

Write for Prices.

**NEW YORK.**



## LANE'S SELF-LOCKING TACKLE BLOCKS,

Anti-Friction Steel Bushings,

Holds the load at any point, and always sure.  
SEND FOR CIRCULAR.

For sale by the Hardware trade.

—MANUFACTURED BY—

**LANE BROS.**  
POUGHKEEPSIE, N. Y.

He had in his possession 55 skeleton keys  
which the police claim would open any door.  
—Chicago Tribune.

**You are selling** that kind of a lock every day and  
your customers think you are selling the best the market affords.

**ARE YOU SELLING** the best the market affords?

**The Craig Locks are guaranteed Sneak Thief Proof.**

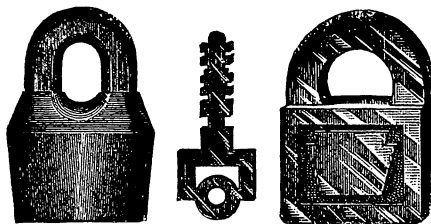
Send for Catalogue.

**KEYLESS LOCK CO.,** 1. A. 197 So. Canal St., Chicago, Ill.

### KEYSTONE LOCK WORKS,

—Established 1879.—

**E. T. FRANK,** Lancaster, Pa., U. S. A.  
MANUFACTURER OF



Patent Inter-Locking Tumbler Scandinavian or Jail  
**PADLOCKS**, in 36 grades and sizes. Key and  
Self-Locking. Brass, Bronze, Steel and Malleable  
Iron. Red, Black, Bower-Barff and Bright Brown  
finish. Also a full line of fine flat padlocks in Bronze  
and Steel. All fully described and illustrated in our  
new catalogue, furnished free to the trade.

**SURPLESS, DUNN & ALDER,**

General Agents, 97 Chambers St., New York.

**SIMPLEST IN CONSTRUCTION.  
EASIEST FITTED.**



**Cheapest and Best  
Balance Made.**

WRITE FOR CATALOGUE.

**The Vanderbilt Sash Balance Co.**  
CANANDAIGUA, N. Y.

General Agents, Harmon & Dixon, 118 Chambers St.  
New York.

### Porcelain Lined Lemon Squeezers



Best Common Mouse Traps, Steak Hammers,  
Boot Jacks, Lap Boards, Beacon Hill Pat. Mouse  
Traps, Mallets, Bung Starters, Hand Screws.

**Ripley Mfg. Co.,** Unionville, Conn.

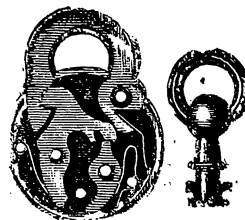
## PATENT PERFECTION PADLOCK

*Eight Tumblers. Key Turning Both Ways.*

Sizes;  $\frac{1}{4}$  inch to  $2\frac{1}{4}$  inches; of cast bronze. Defies competi-  
tion for quality and price. No steel or iron used, cannot rust, and  
cannot be picked. Also,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch Padlocks, opened with  
a common pin, in brass and nickel, for cats and small dogs.  
The best Railroad Switch and Car Lock in the world.  
Adopted by the United States Treasury for bonded warehouses.

**AMES SWORD CO.,** Chicopee, Mass.

Send for Price Lists and Circulars.



## DO YOU WANT NON-PICKABLE LOCKS

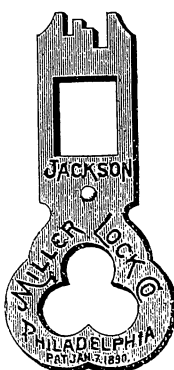
For some extra severe service? For some place where they  
will be used many times daily by different persons? Would  
you like a higher degree of security than you get from any  
other lock you ever tried?

The "JACKSON" Locks are recommended for just such  
service. Constructed upon new and original principles, they are  
strong, well finished and far more secure than any com-  
petitor.

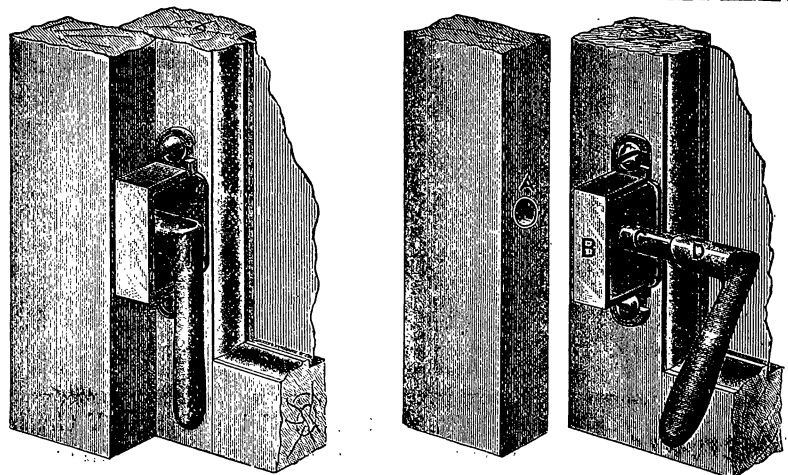
We state for a fact that, so far as we know, these locks are  
unpickable. We make Latches, Hotel and Store Door  
Locks, Drawer, Cupboard, and Chest Locks, Post  
Office and Safe Deposit Locks, etc. Please order of your  
jobber.

**MILLER LOCK CO., - Lock Manufacturers,**

No. 4515 Tacony St., PHILADELPHIA, PA.



## DOLBER'S SASH FASTENER.



Patented August 1, 1893

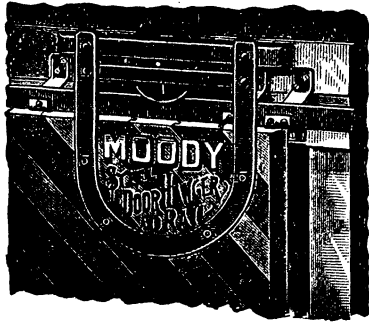
The best device ever invented for fastening outside, storm or double windows, and all similar purposes.

Saves Time, Labor and Expense.

**F. V. WOOSTER, Manufacturer,**

66 Beverly St., BOSTON.

VICTOR MFG. CO., Newburyport, Mass.

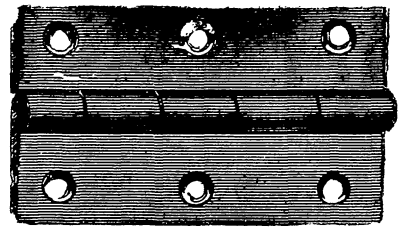
**STEEL RAIL.**

Showing one-half set of hangers attached to door.



The Only Bracing Bracket Made.

HANGERS.	PRICE-LIST.	Per Doz. prs.
No. 5, to run 6 feet, 3 1/4 in. wheel,	-	\$10.00
No. 6, to run 10 feet, 4 1/4 in. wheel,	-	15.00
No. 7, to run 15 feet, 5 1/4 in. wheel,	-	22.00
RAIL, per foot.....	6 1/2 cents	

**Cast Brass Butt Hinges**

IN STOCK AND FOR SALE BY

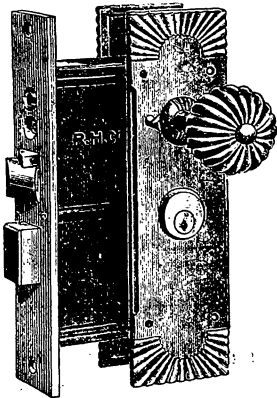
**W. & J. TIEBOUT,**

Nos. 16 &amp; 18 Chambers Street, New York,

MANUFACTURERS OF

**BRASS, GALVANIZED & SHIP CHANDLERY  
HARDWARE.**

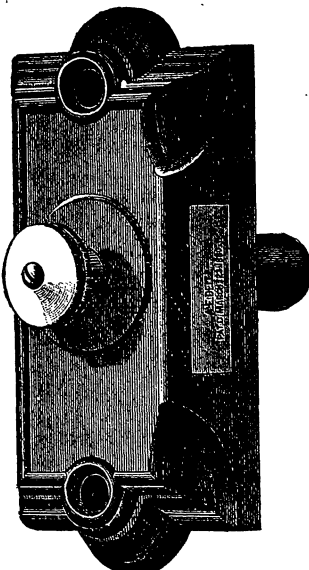
**"VASSAR"**  
CYLINDER LOCKS.  
FINE  
BUILDERS' HARDWARE.



Solid Bronze Metal.  
Wrought Bronze.  
Rust-Proof Iron.

READING  
HARDWARE COMPANY,  
READING, PA.

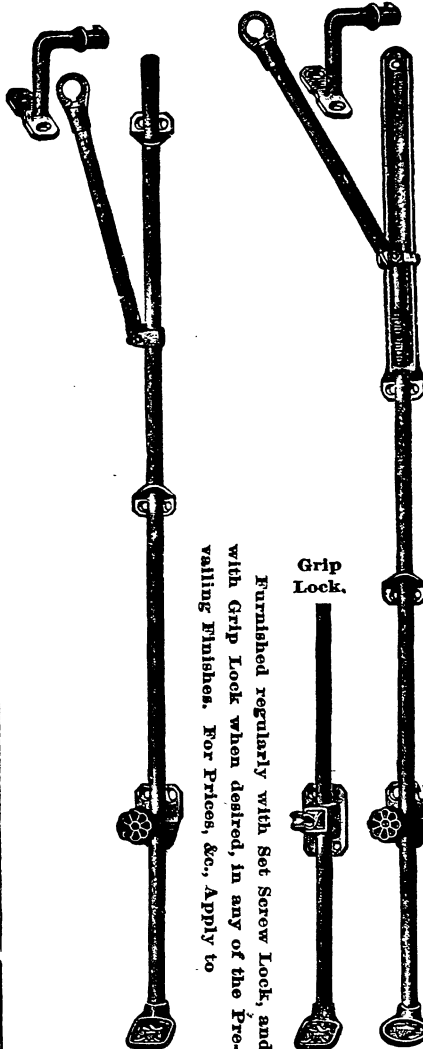
NEW YORK. PHILADELPHIA. CHICAGO.

**A. E. DEITZ.**

No. 172 Lock.

J. C. McCARTY & CO., Agents, 97 Chambers  
and 81 Reade Sts., New York.  
Factory, **BROOKLYN, E. D., N. Y.**

**3** NICKLE, Silver and Bronze Metallic  
Figures and Letters, Sizes 1/4 in to 3 in.  
Pattern Letters, Steel Stamps, Brands  
Dies &c. Send for Reduced Price List.  
We make a specialty of the Hardware Trade.  
**A. A. WHITE & CO., Providence, R.I.**

**TRANSOMLIFTERS****"EAGLE."****"SHIELD."**

Furnished regularly with Set Screw Lock, and  
with Grip Lock when desired, in any of the Pre-  
vailing Finishes. For Prices, &c., Apply to

Grip  
Lock.

**J. F. WOLLENSAK, PATENTEE**  
**CHICAGO, ILLINOIS.**

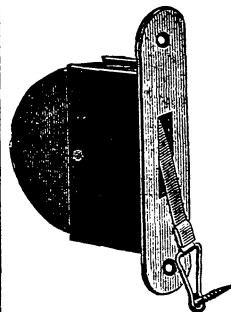
**SASH WEIGHTS****E. E. BROWN & CO.,**

McKean and Meadow Sts.,

**PHILADELPHIA PA.**

**IT PAYS.** Nothing about a Hard  
ware Store looks so  
well as clean shelves and the goods neatly boxed  
with a fresh sample on the front. Customers  
are attracted by such a display of care, and no-  
tice and buy things that would ordinarily go  
without notice. The Boxes are inexpensive,  
save the goods, make a big show for a small in-  
vestment and help the salesmen. Send to  
**JESSE JONES & CO., 615 and 617 Com-  
merce St., Phila., Pa.,**  
for Catalogue of prices, styles and references.

**AN ACTUAL NECESSITY**  
with Architects, Builders,  
and Railroad Corpora-  
tions

Simple, economical,  
and low in price.By using a steel  
frame our balance is  
much superior to  
other makes.Can be applied to  
old as well as new win-  
dows.Requires no box  
frames.

Warranted 15 years.

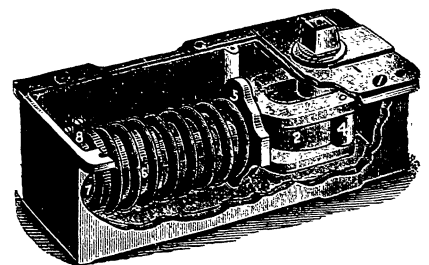
Cord lasts 5 years.

Write for price-list.

**PULLMAN SASH BALANCE CO., Rochester, N. Y.**  
New York Office, 142 Chambers St.  
Chicago Office, 235 Lake St.



N. Y. Office, 108 Chambers St. W. H. QUINN, Manager.




**CHECKING SPRING HINGES**  
**FOR SWING DOORS.**

Applied in floor under door. They close the door  
gently, without noise or violence and stop it at once  
at the centre. Doors cannot sag, springs do not break  
or set.

**J. BARDSLEY, 149 & 151 Baxter St., New York.**

Illustrated Price-List on Application.

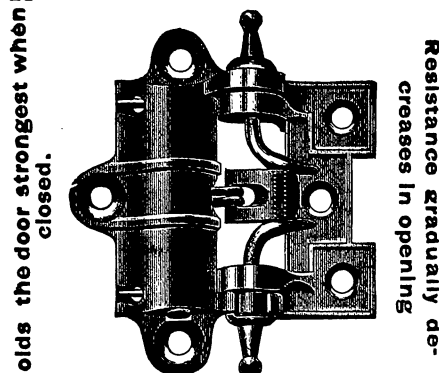


**FROST'S ANTI-RATTLEB**  
 Pat. Jan. 20, 1880.  
*Out One-half Size.*  
 Sample pair sent to any hardware or saddlery firm by addressing  
**The Frost Thill Spring Co.**  
 Boston, Mass.

**THE WILCOX & HOWE COMPANY,**  
**BIRMINGHAM, CONN.,**  
 MANUFACTURERS OF  
**A Full Line of Carriage Hardware**  
**ALSO SPECIAL FORGINGS.**

Estimates cheerfully given. Send for Catalogue

**NEW IDEA SPRING HINGE**



and increases in closing the door.  
 A covered (patented) hold-back Spring Hinge. Full particulars, free Sample and Prices by mentioning this paper.

**STOVER MANUFACTURING CO.,**

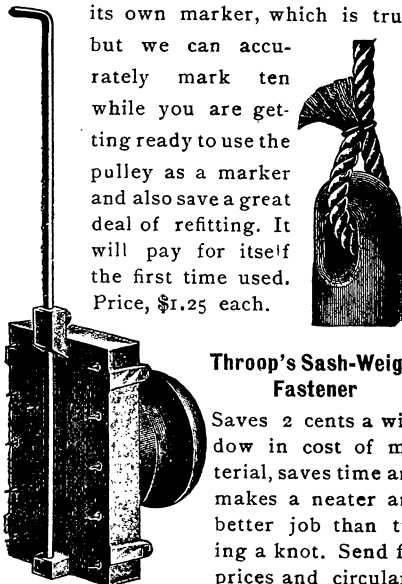
145 River St., Freeport, Ill.

**WE CLAIM**  
 THAT

**Grennan's Sash Pulley Marker**

For Common Sense Pulleys is a necessity although it is claimed that each pulley is

its own marker, which is true, but we can accurately mark ten while you are getting ready to use the pulley as a marker and also save a great deal of refitting. It will pay for itself the first time used. Price, \$1.25 each.

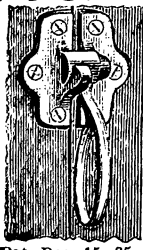


**Throop's Sash-Weight Fastener**

Saves 2 cents a window in cost of material, saves time and makes a neater and better job than tying a knot. Send for prices and circulars.

**J. W. Skelly & Son, - BRISTOL, CT.**

**P. J. Conroy & Co.,**  
 Paschall, PHILADELPHIA.



**"CONROY"**  
**Refrigerator Door**  
**Fasteners**

Have rapidly supplanted all others.

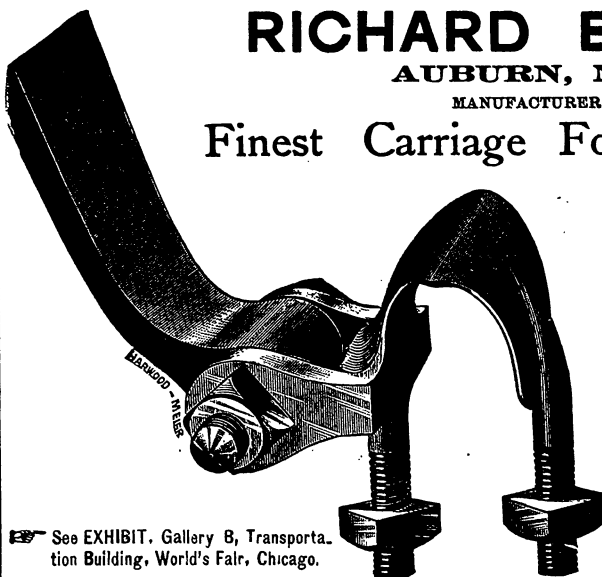
Refrigerator Trimmings

Pat. Dec. 15 '85.



All Tags and Labels on Covert Goods bear the above Trade-Mark, and are sold by all Leading Jobbers in General and Saddlery Hardware at Manufacturers' Prices.

**COVERT MFG. CO.,**  
**WEST TROY, N. Y.**



**RICHARD ECCLES,**

**AUBURN, N. Y.,**

MANUFACTURER OF

Finest Carriage Forgings, Couplings, Clips, King Bolts, Fifth Wheels, &c. Manufacture a full line Special Drop Forgings.

See EXHIBIT, Gallery B, Transportation Building, World's Fair, Chicago.

Send for New Catalogue for Season 1893-94.

**WHY USE WOODEN OR HEAVY STEEL BLOCKS**

WHEN THE STEEL AND IRON

**TACKLE BLOCKS**

—MADE BY—

**The Cleveland Block Co.**

**CLEVELAND, OHIO, U. S. A.,**

**ARE BETTER IN EVERY WAY.**

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable.

General Agents: Topping Brothers, 92 Chambers Street, New York.  
 The H. Channon Co., 22 Market Street, Chicago.  
 New England Agents, - Dodge, Haley & Co., 212 High Street, Boston.



**STEEL. WOOD OR IRON**

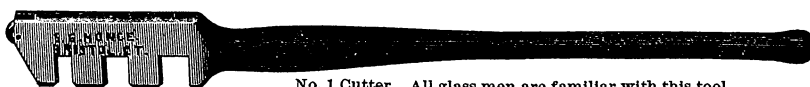
—MADE BY—  
**TOLEDO BLOCK WORKS,**

511-513-515 Water St., TOLEDO, OHIO,

WILL PROVE SATISFACTORY

**TO USER.**

**MONCE'S NOVELTY GLASS CUTTERS. —INTERCHANGEABLE LOCK STENCILS.**



No. 1 Cutter. All glass men are familiar with this tool.

**S. G. MONCE, - - BRISTOL, CONN.**

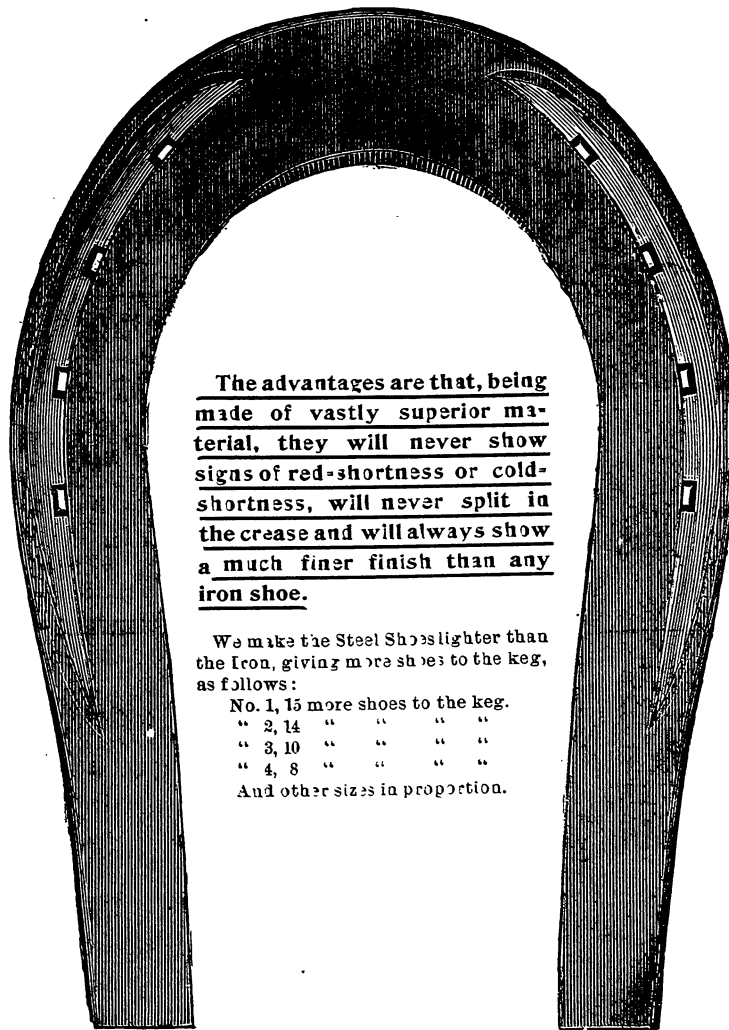
# STEEL HORSE SHOES,

Like Steel Rails and Steel Nails,

## HAVE COME TO STAY.

**Shoenberger & Co., Pittsburgh, Pa.,**

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes and are now making from this steel Extra Swaged, and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



The advantages are that, being made of vastly superior material, they will never show signs of red-shortness or cold-shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1,	15	more shoes to the keg.
" 2,	14	" " " "
" 3,	10	" " " "
" 4,	8	" " " "

And other sizes in proportion.

**No. 2 JUNIATA MULE SHOE.**

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

We would also call your attention to our Improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities use sand or borax in welding on a calk and cool off at a dark red, or still better, cool off without plunging in water. We make sizes numbers 1, 2, 3, 4, 5 and 6, packed in 25-pound boxes.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

## SHOENBERGER & CO.,

**JUNIATA IRON AND STEEL WORKS, - - - PITTSBURGH PA.**



# SCRANTON FORGING CO.,

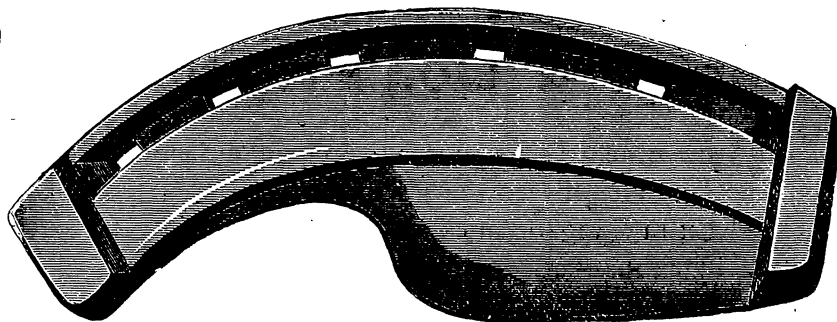
SCRANTON, PA

## CARRIAGE HARDWARE AND SPECIAL DROP FORGINGS.

FORGED

OX

SHOES.



Made under Deebie's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.

## BURDEN'S HORSE SHOES.

"Burden Best"

Iron

Boiler Rivets.

The Burden Iron Co.

TROY, N. Y.

Standard Horse Shoe Co.,

Manufacturers of

HORSE AND MULE SHOES.

LEEDS, ROBINSON &amp; CO., General Agents,

75 North Street, Boston, Mass.

Crescent

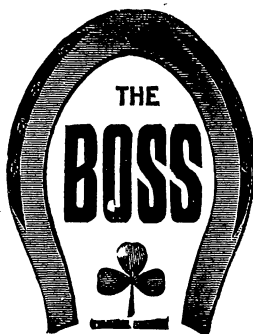
Horse and Mule Shoes,

BAR IRON.

CRESCENT HORSE SHOE AND

IRON CO.,

Max Meadows, Va.



## HORSE AND MULE SHOES.

Superior Quality, Shape and Finish.

BRYDEN HORSE SHOE CO.,

CATASAUQUA, PA.

RHODE ISLAND PERKINS HORSE SHOE CO.,  
MANUFACTURERS OF

## Horse and Mule Shoes of the Perkins Pattern.

SPECIALTIES:—X L Steel Shoes, Toe Weight Shoes and Goodenough Shoes.

Works at Valley Falls, R. I.

Office, 31 Exchange Place, Providence, R. I.

F. W. CARPENTER, Pres.,

C. H. PERKINS, Gen. Manager,

R. W. COMSTOCK, Sec'y,

CHARLES R. STARK, Treas.

J. C. McCARTY &amp; CO., Agents - 97 Chambers Street, New York.

## THE NEW DIAMOND STATE HORSE AND MULE SHOES.

JUST TRY THEM and YOU will say they excel all others.

MANUFACTURED BY

## DIAMOND STATE IRON CO.

WILMINGTON, DELAWARE.

Other "high grade" specialties in Rivets, Spikes, Splice Bars, Track and Machine Bolts, Blank Nuts, Stay Bolt Iron, Horse Shoe Iron, Bar Iron, &amp;c.

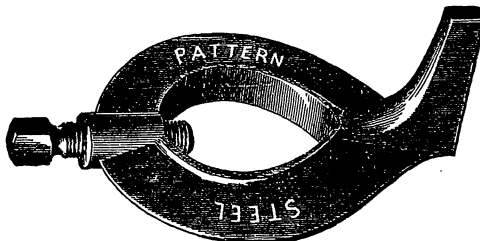
PHILADELPHIA OFFICE,  
206 So. Fourth St.

{Correspondence invited}

NEW YORK OFFICE  
11 Pine St.

## LE COUNT'S LIGHT STEEL DOG,

WITH STEEL SCREWS.



U. S. Standard. Points Hardened.

No.	Inch.	Price.	No.	Inch.	Price.
1.....	3/8.....	\$0 35	7.....	1 3/4.....	\$1 00
2.....	1/2.....	35	8.....	2.....	1 10
3.....	3/4.....	50	9.....	2 1/2.....	1 40
4.....	1.....	60	10.....	3.....	1 50
5.....	1 1/4.....	75	11.....	3 1/2.....	1 70
6.....	1 1/2.....	85	12.....	4.....	1 90

Small set of 8, \$5.50. Full set of 12, \$12.

SEND FOR CATALOGUE OF FULL LINE OF MACHINISTS' TOOLS.

C. W. LE COUNT, MANUFACTURER, SO. NORWALK, CONN., U. S. A.

These goods are for sale by CHAS. CHURCHILL &amp; CO., Ltd., 21 Cross St London, England.

# H. D. SMITH & CO.,

Plantville, Conn.,

MANUFACTURERS OF THE BEST QUALITY

## CARRIAGE MAKERS' HARDWARE,

MANUFACTURE THE LARGEST VARIETY OF

# FORGED CARRIAGE IRONS

Of Best Material and Workmanship.

Send for Price and Illustrated List of

# CHAMPLAIN

Manufactured by the NATIONAL HORSE NAIL CO.,  
VERGENNES, VERMONT.

All Sizes. All Patterns. All Warranted. Sold Everywhere.

J. C. McCARTY & CO., Agents. New York.



Elegant Iron.  
Beautiful Shape.

HORSE SHOES,  
*Light, Medium and Heavy.*  
MULE SHOES,  
*Light, Medium and Heavy.*

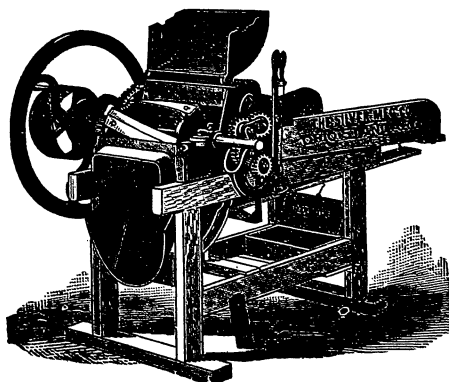
Illustrated booklet and prices to all  
parts of the world on application.

OLD DOMINION IRON AND NAIL WORKS CO.,

ARTHUR B. CLARKE, President.

Chicago Office, 45 La Salle St.

Richmond, Va., U. S. A.



THE "OHIO" Feed and  
Ensilage Cutters and Car-  
riers are the best.

By reason of wide open throat  
and improved feeding device  
(being full width of cutting sur-  
face, all sizes), our machines  
have greater capacity than others.

THE SILVER MFG. CO. Salem, O.

**P. F. BURKE, C. F. DEWICK & CO.**  
Successor to  
Manufacturer of  
**PATENT STEEL**  
(Blunt and Sharp)  
**TOE-CALKS.**  
—ALSO—  
BURKE'S IMPROVED  
**HORSESHOERS'**  
**FOOT VICE.**  
Send for Circulars.  
360 Dorchester Av. Die for Welding  
BOSTON, MASS. Sharp Calks.

## PHOENIX HORSE SHOES.

PHOENIX HORSE SHOE CO.,

Poughkeepsie, N. Y.

NEW YORK OFFICE, No. 66 Reade St.

## AXLEINE



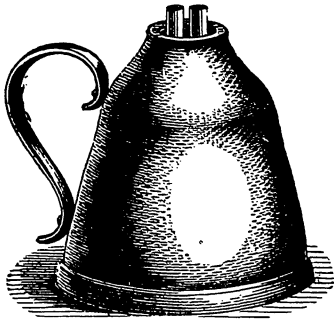
is a fine quality of Axle  
Grease put up in square  
tin boxes containing  
one pound; beautifully  
decorated in assorted  
colors; designed espe-  
cially for the Hardware  
Trade. Showy and at-  
tractive shelf goods.

Send for sample and  
prices.

LOVELL, TRACY & CO. 71 Asylum St.,  
Hartford, Conn.

# BUFFALO SCALE CO., Buffalo, N. Y. SCALES OF ALL KINDS.

PATENTED ARTICLES  
OF  
**Malleable Iron.**  
Hammer's Malleable Iron Hand Lamps.



SCREW, KEROSENE SIZE.

Hammer's Adjustable Clamps.  
Hammer's Malleable Iron Oilers, 3 Sizes  
Hammer's M. I. Hanging Lamps.  
**NEW** pattern Heavy Screw Clamp  
strongest in the Market.

For sale by all the principal Hardware Dealers.

Send for Price List.

**MALLEABLE IRON CASTINGS**

Of superior quality, and Hardware Specialties  
in Malleable Iron made to order.

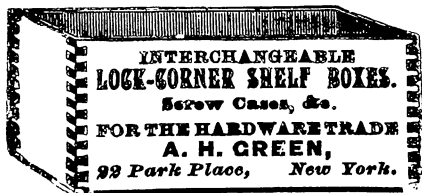
**HAMMER & CO.**  
BRANFORD, CONN.

**HOWARD IRON WORKS,**  
BUFFALO, N. Y.

Manufacturers of

**BENCH VISES.**

Price Lists sent on application.



**BERGER'S PATENT TRUCKS.**

The Handiest, Cheapest and  
best in existence.

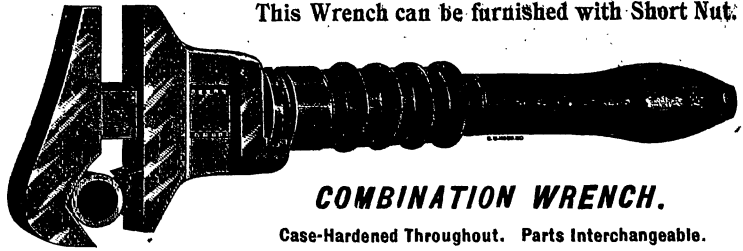
Highest testimonials from those in  
use. Wholesale agents wanted in every  
city. Correspondence from Truck Man-  
ufacturers solicited. Circulars, price-  
lists and full particulars furnished.

**BERGER BROS.,**

237 Arch St., Philadelphia, Pa.



This Wrench can be furnished with Short Nut.

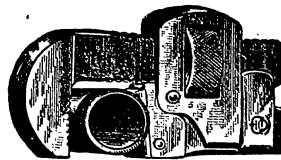


**COMBINATION WRENCH.**

Case-Hardened Throughout. Parts Interchangeable.

This wrench not only combines the superior qualities of a Gas Pipe Wrench but also all the  
requisite combinations of a regular Nut Wrench, thus making a combination which has no equal.  
For Circulars and Price-List, address

**BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass., U. S. A**



**TRIMO PIPE WRENCH,**

Forged Steel

All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no  
trouble in close quarters. Does not crush the pipe.

**TRIMO**

**CHAIN  
PIPE  
WRENCH.**



Superior in strength and ease of operation.  
COMPLETE circular grip. Never slips nor crushes.

Can be used with one  
hand and in closer quarters  
than any other Basin  
Wrench. Parts Interchange-  
able.



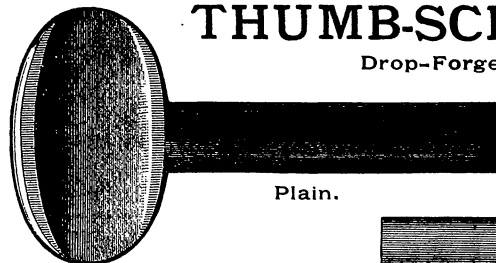
**TRIMO  
BASIN WRENCH.**

**TRIMONT MFG CO.,** ROXBURY,  
MASS.

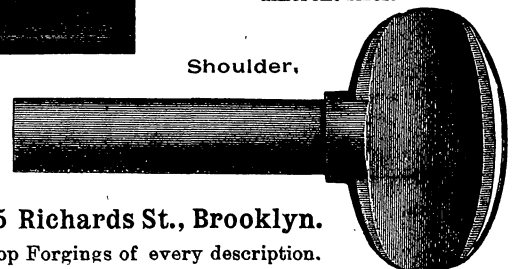
**THUMB-SCREW BLANKS**

Drop-Forged from Bar Steel.

Carried in stock in seventy-five  
different sizes.



Plain.



Shoulder.

Send for Price-List to

**J. H. Williams & Co., 9 to 15 Richards St., Brooklyn.**

Iron, Steel, Copper and Bronze Drop Forgings of every description.

**SINGLE END WRENCHES**



For Standard Hexagon Nuts

Finished or Unfinished

DROP FORGED from BEST BAR STEEL  
in Lengths from 6 to 24 inches

Taking Nuts for 1/4 up to and including Nuts for 1 3/4 inch bolts

**THE BILLINGS & SPENCER CO.**

HARTFORD, CONN.

**"ALWAYS READY" WRENCH.**

FORGED STEEL, NICKEL PLATED.

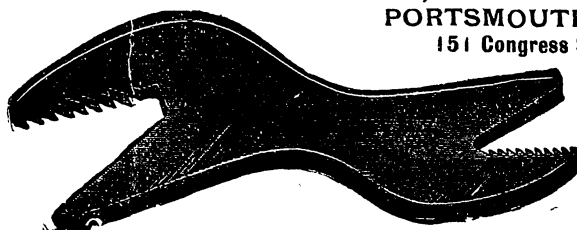
**PORTSMOUTH WRENCH CO.,**

151 Congress St., Boston, Mass.

SEND FOR PRICES.

Machinists, Carriage Makers,  
Blacksmiths, Mechanics, Spin-  
ners, Weavers, Carders, and in  
all Departments of Woolen and  
Cotton Mills, Farmers, House-  
keepers, and in fact everybody  
that ever uses a wrench

**NEEDS THIS ONE.**



**LORING COES & CO.**

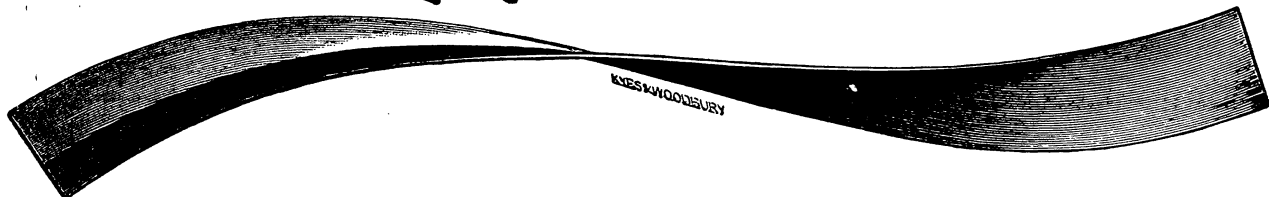
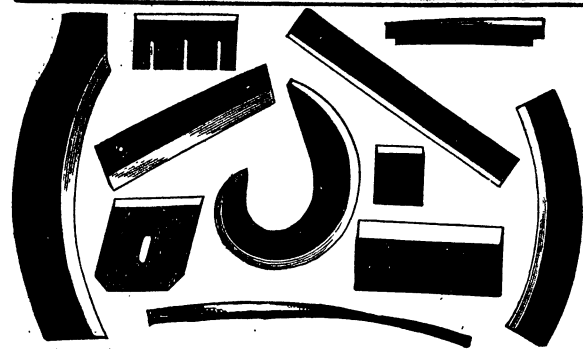
WORCESTER, MASS.

Manufacturers of **MACHINE KNIVES.**

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.

End view of Plated Stock for Dies, Lawn Mower Knives, Blades

Etc., showing how the Steel is laid.

**THE IMPROVED ACME STEEL WRENCH**

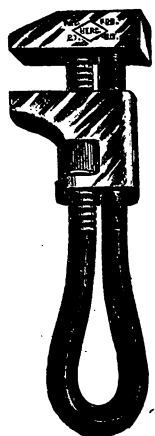
PATENTED.

**CAPITOL MFG. CO.,**

Cable Address: "CAPITOL, CHICAGO."

125 to 137 REES STREET, CHICAGO, ILL., U. S. A.

Awarded Prize Medal at Paris Exposition and Jamaica Exposition



HERCULES. Bright Finish.



HERCULES. Combination Pipe, Bolt and Nut Wrench. Bright Finish



This Screw Driver is made from one piece of special cast steel, in all sizes, from 1 1/4 in. to 12 in. The blade is well polished, carefully tempered, and every screw driver is subjected to a severe test and warranted. Handles Japanned with the best quality baking Japan.

The Strongest and Most Durable Wrench and Screw Driver Made. Write for Prices and Full Information.

HARMON &amp; DIXON, 118 Chambers St., New York, N. Y., Eastern and Export Agents

**L. COES'**

Genuine Improved KNIFE HANDLE PATENT

**Screw Wrenches**

MANUFACTURED BY

**COES WRENCH CO.,** WORCESTER, MASS.

Established in 1839.

Registered March 31, 1874.

Patented July 6, 1880.

Patented July 8, 1884.

Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

Straight Bar, Extra Long Nut for Screw in Jaw.

The BEST MADE and STRONGEST WRENCH in the MARKET

J. C. McCARTY &amp; CO., JOHN H. GRAHAM &amp; CO. { New York Agents.

**IMPROVED MINE LAMP**  
FOR ANTHRACITE AND BITUMINOUS MINING.

6 DIFFERENT STYLES OF SPOUTS.

SEAMLESS BRASS COLLAR  
BRASS HINGE  
Solid Lid  
No SOLDERING

SAMPLE 15¢.

B. E. LEONARD, Scranton, Pa.

**PATENT AIR TUBE MINE LAMP.**  
FIVE DIFFERENT SIZED SPOUTS.

SEAMLESS BRASS COLLAR  
BRASS HINGE  
Solid Lid  
NO SOLDERING  
HINGE CANNOT MELT OFF.

SEND 15 CENTS FOR SAMPLE TO SAMPLE

T. F. LEONARD - Scranton, Pa.

**Boss Sprinkler.**

For Potatoes, Tobacco, Cotton and all small Plants and Vines.

Has given satisfaction to all who have handled it.

Prices and Circulars sent on application.

**OLIVER A. SMITH,**  
CLARKSTON, MICH.

The Cockburn Barrow and Machine Co.

OFFICE AND WORKS:

234 to 240 Eleventh St., - JERSEY CITY, N. J.

**NEW CONCRETE MIXING MACHINES.**

Coal and Ash Buckets, Coaling Tubs, Coal and Coke Cars, Patent Tubular Frame Wheelbarrows, Furnace, Charging Barrows and Cars, Sheet Iron Work of every description, Patent Power Punching Machines, Every Description of General Forgings, Dimpfel Blow Machine Work

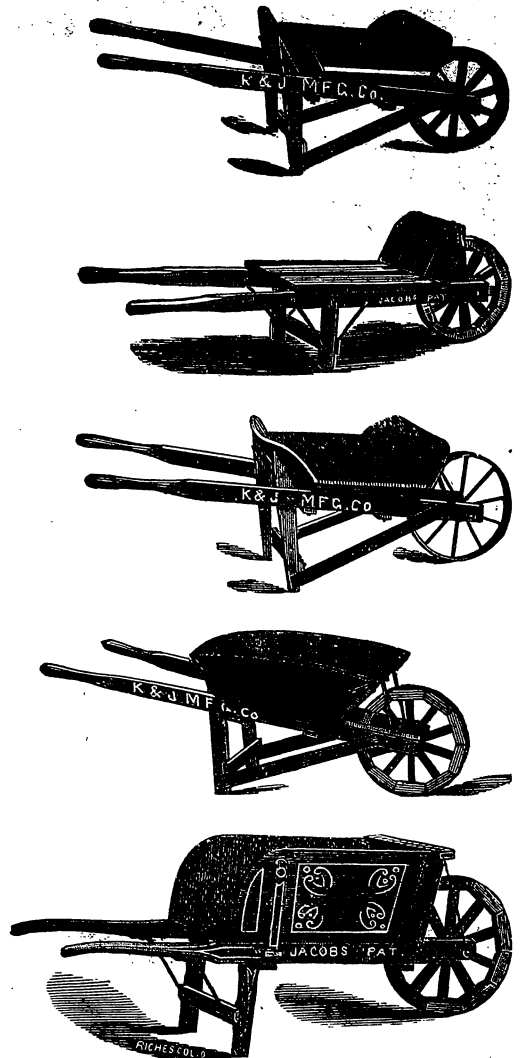
Electric Toy Making, Dynamo Building and Electric-Motor Construction. By T. O'CONOR SLOANE, A.M., E.M., Ph.D. This work treats of the making at home of electrical toys, electrical apparatus, motors, dynamos, and instruments in general and is designed to bring within the reach of young and old the manufacture of genuine and useful electrical appliances. The work is specially designed for amateurs and young folks. Very fully illustrated.....\$1.00.

For sale by David Williams, 96-102 Reade St., N. Y.

# A SQUARE HOUSE.

The reputation of our productions is the result of many, many years' effort expended in pleasing and catering to the particular requirements of our trade. The experience and knowledge gained in this continuous effort have enabled us to, we are proud to state, build up the largest business of its kind in the world (the making of wheelbarrows, trucks, scrapers, sinks, etc.), which we offer at prices beyond any competition. As a dealer, are you awake to the opportunities we offer? If not write us and we will forward free complete catalogue and net prices when requested.

THE  
KILBOURNE & JACOBS MFG. CO., COLUMBUS, O.,  
U. S. A.



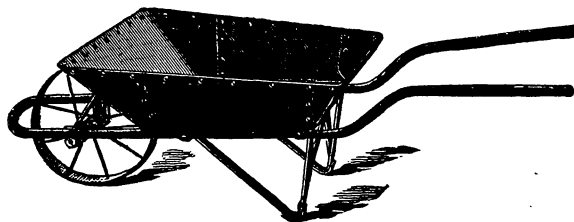
Chadborn & Coldwell  
Mfg. Co.,

NEWBURGH, N. Y.,  
—Sole Manufacturers of—



Send for Illustrated Catalogue.

## Akron Tubular Steel Wheelbarrows.



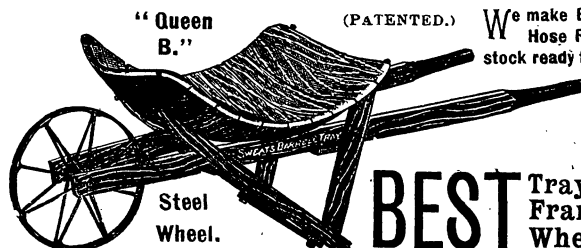
Re-enforced Tray, Strong and Durable.

Also McNeil's Patent Balanced Charging Barrows, Automatic Dump.

Write us for Prices.

THE AKRON TOOL CO., AKRON, O.

"BARREL TRAY"  
WHEEL BARROWS  
ARE THE BEST ON EARTH.



We make Barrows of every description, Factory Trucks, Hose Reels, Mortar and Brick Hods, and carry large stock ready for shipping.

Get our prices and we will get your orders.

SWEATT MFG. CO.,  
Minneapolis, Minn.

J. C. McCARTY & CO., New York, Direct Representatives.

G. A. SEAVER, New Orleans, Special Agent.

## ALL STEEL WHEELBARROWS & SCRAPERS



MANUFACTURED BY

AMERICAN STEEL SCRAPER CO.,

1104 Court Street, SIDNEY, C.





# Individuality

Is the inherent strength contained in an article offered for sale. Our barrows and scrapers possess this qualification in the highest degree. There are none better, nor cheaper. Write

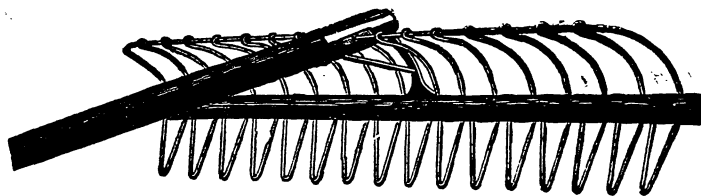
SIDNEY STEEL SCRAPER CO.,

924 Poplar St., Sidney, Ohio.

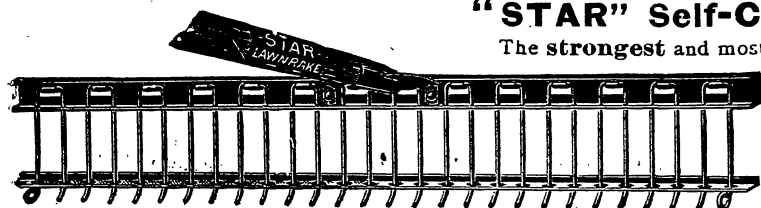
## LAWN RAKES. The "GEM" AND "DAVIS."

Both good and each the best. If you have not stocked up, better do so at once. Our prices are low.

SCHAEFFER & CO., Dayton, O.



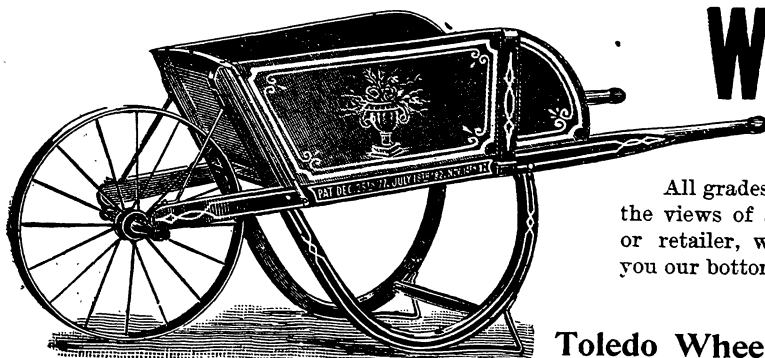
### "STAR" Self-Cleaning Lawn Rakes. All Steel.



"STAR" Self-Cleaning Lawn Rake.  
Pat. Feb. 21, 1893.

The strongest and most practical rakes in the market. The cleaning bar keeps the teeth free from leaves and grass and the eyes on the end teeth prevent the other teeth from digging in the ground. We also make "STAR" Lawn Rakes as above without the self-cleaning bars and turned up end teeth.

SYRACUSE SPECIALTY MFG. CO., Syracuse, N. Y., U. S. A.  
SURPLESS, DUNN & ALDER, 97 Chambers St., New York,  
DIRECT REPRESENTATIVES.

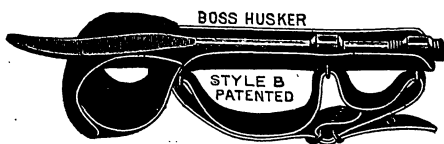


## WHEELBARROWS.

All grades, all styles, all sizes, at prices that will meet the views of any hardware dealer in the country. Jobber, or retailer, write us your requirements and we will name you our bottom prices.

Toledo Wheelbarrow Works, - Toledo, Ohio.

## PERKINS "BOSS" HUSKERS



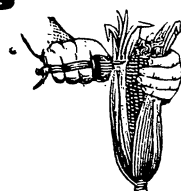
and Hand Protectors.

TRADE SOLICITED.

—MANUFACTURED BY—

BOSS MFG. CO.,

96 Trade Street, Kewanee, Ill., U. S. A.



## STEEL BARROWS.

LANSING WHEELBARROW CO.

LANSING MICH.

## American Stamping Co.,

Manufacturers of

All Kinds of Tinware and Sheet Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.  
Factory, 103 to 119 N. 3d St., Brooklyn, E. D., N. Y.



## PENNSYLVANIA.

INVITATION.

We cordially invite our friends and customers to visit our Exhibit at World's Fair, Chicago, where will be seen the finest and most complete line of Lawn Mowers ever put on the market.

REMEMBER THE LOCATION:

Horticultural Building, North Wing, Section F, Column 73.

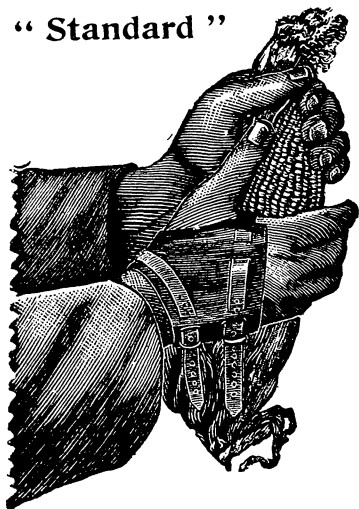
**SUPPLEE HARDWARE CO.,**  
PHILADELPHIA.

New Quaker City

Great American.

CONTINENTAL.

The  
"Standard"



# Corn Husker

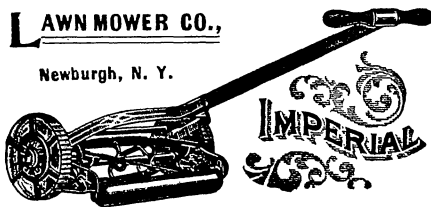
Easier to use, does more work, can be used in any manner, doesn't interfere with tying fodder. Guaranteed the cheapest practical Husker made. Write,

**Moore & Wickert, Mfrs.,**  
GREEN SPRING, OHIO.

Beats  
Them All.

**COLDWELL****LAWN MOWER CO.,**

Newburgh, N. Y.



**THE BEST MOWER**  
ON THE MARKET.

SEND FOR OUR PAPER

"THE LAWN,"

IT IS FULL OF INFORMATION ABOUT LAWN MOWERS.

**THE F. & N. MFG. CO.,**

Manufacturers of

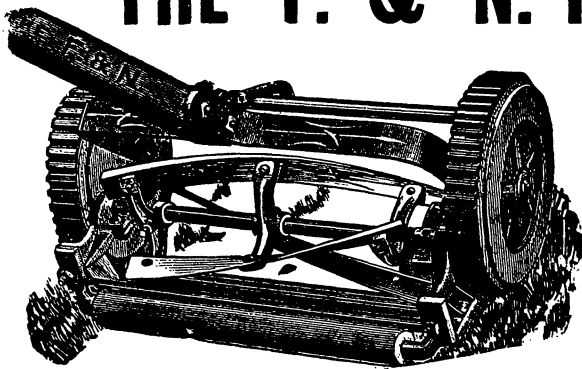
**Lawn Mowers, Lawn  
Sweepers**

**and Grass Catchers,**  
RICHMOND, IND., U.S.A.

The F. & N. High Grade Lawn  
Mower. Fully Guaranteed.

AGENTS

Woodrough & Hanchett Co.,  
Chicago, Ill.  
C. F. Guyon Co., Ltd., New York.  
Woodrough, Mansfield & Co.  
Boston Mass.

**HUMANE CATTLE CLEANER & CURRY COMB**AGENTS  
WANTED.

SAMPLE POSTPAID 24 CTS

YOU CANNOT AFFORD TO BE WITHOUT IT  
F.E. KOHLER & CO. CANTON, OHIO.

**THE HOUSEWIVES DELIGHT CAN OPENER.**

THREE DISTINCT TOOLS FOR THE PRICE OF ONE.

IN USE

IN USE

IN USE



ON ROUND CAN ON SQUARE CAN AS SKEWER PULLER  
SAMPLE POSTPAID 20 AGENTS WANTED.  
F.E. KOHLER & CO. CANTON, OHIO.

**HENLEY'S LAWN MOWERS**

First-class high grade machines made of the best materials. Neat, symmetrical, strong, durable and unexcelled in construction and ease of operation. Does perfect work. For prices address



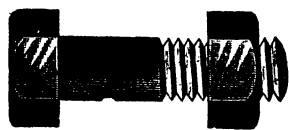
**M. C. HENLEY, Sole Mfr., Richmond, Ind., U. S. A.**

CARPENTER & BAYLES, Eastern Agents, 91 Chambers St., and 73 Reade St., New York City.



# WROUGHT WASHERS

Every Washer  
FLAT  
With hole in  
TRUE CENTER.



## MACHINE BOLTS.



## HOT PRESSED NUTS.

Highest  
Standard of  
EXCELLENCE.

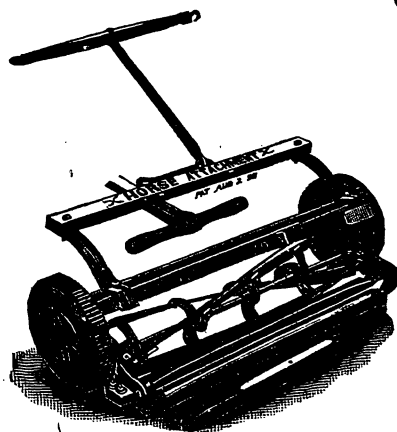
Packed in kegs for general trade, or in 1 and 5 lb. boxes for hardware trade.

It will pay you to correspond with us.

MILTON MANUFACTURING CO., - - MILTON, PA.

# THE "CHIEF" MOWER

With Horse Attachment.



TEN INCH TRACTION WHEEL. EXCELS FOR FINE QUALITY OF MATERIAL AND FINISH. SIMPLE ADJUSTMENTS, SMOOTH CUTTING.  
THE ONLY FIRST-CLASS COMBINATION MOWER ON THE MARKET. PRICES LOW, TERMS REASONABLE.

Mfd. by **CHAMPION MFG. CO.,**

LAWN MOWERS,  
RAKES, Etc.,

257 Ft. Wayne Ave., Richmond, Ind.

# SOMETHING NEW

A strictly high grade LAWN MOWER at the price of a cheap one, owing to a radical change in design and construction in the present style of machine.

—A GREAT HIT.—

Circulars soon ready.

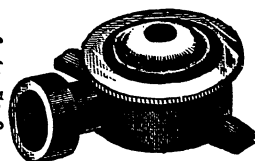
**W. E. LAPE, Syracuse, N. Y.**

## LAWN SPRINKLERS

We manufacture the BEST and CHEAPEST Lawn Sprinklers in the World.



Patent No. 9.



The only Sprinklers which have no revolving parts to leak or wear out.  
The only Sprinklers free from small holes, and which cannot become clogged with gritty substances.  
The only Sprinklers which are adjustable and will give a spray as fine as the mist of Niagara, or as heavy as the area of the supply pipe.  
The best Sprinklers for high pressures, and the only sprinklers which will give satisfaction with low pressures.  
We also manufacture the old style revolving sprinklers, but for our own use would not have them as a gift.



Patent No. 8.

**ETTE & HENGER MFG. CO.**

ST. LOUIS MO.

SEND FOR DESCRIPTIVE CIRCULARS.

Patent No. 6.



## HAY KNIVES

SEASON OF 1892-93.

"LIGHTNING"

(Reg. Trade-Mark No. 9583.)

"BLIZZARD"

Reg. Trade-Mark No. 19,390.

It pays to handle  
FIRST  
CLASS  
goods.



Write us early  
for prices and  
terms.

Sole Manufacturers,  
**The HIRAM HOLT COMPANY**  
EAST WILTON, MAINE.

**The New Britain Hardware Mfg. Co.**

New Britain, Conn., U. S. A.

—MAKERS OF ALL KINDS OF—

Special Machine Screws, Studs, Bolts, &c.  
**BICYCLE PARTS,  
SPECIAL HARDWARE.**

Electro, Brass and Nickel Plating.

Correspondence Solicited.

Address as above

WM. H. HASKEILL, PRESIDENT.

E. S. MASON, TREASURER.

D. A. HUNT, AGENT.

**WM. H. HASKEILL CO.,**

—MANUFACTURERS OF—

**GIMLET POINT COACH SCREWS**

**Bolts, Cold-Punched Nuts and Washers, SUITABLE FOR MACHINERY OF ALL KINDS.**

Office and Works: 451 Main St., PAWTUCKET, R. I., U. S. A.

**HENRY B. NEWHALL CO., Agents,**

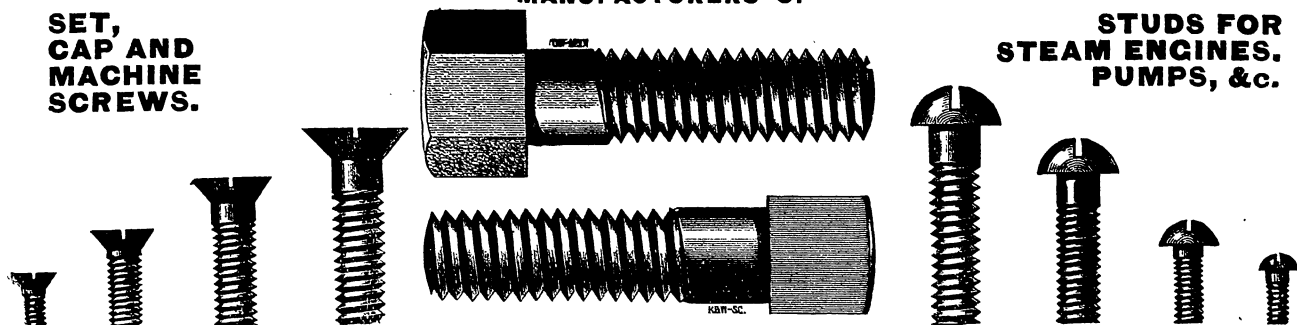
105 CHAMBERS STREET, NEW YORK. - 47 PEARL STREET, BOSTON.

**WORCESTER MACHINE SCREW CO., Worcester, Mass.**

MANUFACTURERS OF

**SET, CAP AND MACHINE SCREWS.**

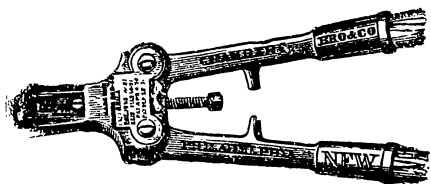
**STUDS FOR STEAM ENGINES, PUMPS, &c.**



**EXPANSION BOLTS.**



For Fastening all Kinds of Structure to Brick and Stone Work.  
Patentee and Mfr., **ISAAC CHURCH, Toledo, O.**  
Send for Catalogue.



**BOLT & RIVET CLIPPERS,**

For cutting off the ends of Bolts and Rivets.  
Liberal discounts to the trade.

**CHAMBERS BROTHERS COMPANY**

52d St., BELOW LANCASTER AVE.,  
PHILADELPHIA, PA.

**WM. H. JACOBUS,**

No. 90 Chambers St., New York.

New York Office of

J. F. Wollensak.  
Barnes Mfg. Co.  
Penn Lock Works.  
Lorenz Bommer.  
Palmer Hdw. Mfg. Co.  
Dibble Mfg. Co.  
Wire Goods Co.  
Garritt & Beach.  
Prindle Mfg. Co.  
Tuck Mfg. Co.  
Henis Vegetable Press.  
Dille & McGuire Mfg. Co.  
National Rivet Works.  
Lufkin Rule Co.  
Wolcott Hdw. Co.  
Zimmerman's Blind Adjusters.  
Burnside Cedar Faucets.  
Fibre Head Mallet.  
Glazier's Patent Hooks.

**RIVETS**  
OF EVERY DESCRIPTION, FIRST QUALITY.

**W.P. TOWNSEND & CO.**

NEW BRIGHTON, PA.

Illustrations of various rivet types: Round Head, Flat Head, Steeple Head, Countersunk Head, Wagon Box Head, Belt Rivet, Cone Head, Rose Head, Truss Head.

ESTABLISHED 1865.

**J. H. Sternbergh & Son,**

READING PA.

**BOLTS, NUTS, WASHERS, RIVETS,**

Including Machine Bolts, Carriage Bolts, Bridge Bolts and Car Bolts,  
**THE HARVEY PATENT GRIP-THREAD TRACK BOLT,** Soft Steel Bolts with Cold Rolled Thread, Bolt Ends, Turnbuckles, Sleeve Nuts, Lag Screws, Set Screws and Tap Bolts and every variety of screwed work.  
**BOILER, BRIDGE AND SHIP RIVETS,** Square and Hexagon Nuts of all kinds and sizes, Plate Washers, Belt Lacing Machines, Rods and Irons for Bridges and Buildings, Merchant Bar Iron, etc., etc.  
Branch Establishment, **THE KANSAS CITY BOLT & NUT CO.,** Kansas City, Mo.

J. FRED WILSON, Worcester, Mass.

**Metal Punching and Die Work.**

Cold Punched Nuts and Washers for all Purposes.

SEND FOR PRICES ON

**SPECIALTIES IN LINE OF PRESS WORK.**



# CLASSIFIED LIST OF ADVERTISERS.

## Advertisement Writer.

Duffy, J. A., Hannibal, Mo.

## Air Chambers, Copper.

Emory, P. F. Mfg. Co., Springfield, Mass.  
Springfield Brass Co., Springfield, Mass.

## Air Compressors.

Norwalk Iron Works, S. Norwalk.  
Band Drill Co., 23 Park Place, N. Y.

## Air Moving Machinery.

Howard & Morse, 45 Fulton, N. Y.

## Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.  
Pittsburgh Reduction Co., Pittsburgh.  
Scovill Mfg. Co., Waterbury, Conn.

## Aluminum, Brass and Bronze.

Gaylord, F. L. Co., Ansonia, Conn.  
Haight & Clark, Albany, N. Y.  
St. Louis Bronze & Aluminum Works, St. Louis, Mo.

## Analytical Chemists.

Britton, J. Blodgett Philadelphia, Pa.  
Hunt, Robt. W. & Co., Chicago, Ill.  
Moore, Dr. Gideon E., 221 Pearl St., N. Y.

## Anti-Friction Metals.—See Babbitt Metal.

## Anvil and Vise (Combination).

Fulton Iron & Engine Works, Detroit, Mich.

## Anvils.

Wright, Peter & Sons, Dudley, Eng.

## Apple Parers.

Goodell Co., Antrim, N. H.

## Arms and Ammunition.

Forehand Arms Co., Worcester, Mass.  
Harrington & Richardson Arms Co., Worcester, Mass.  
Hardley & Graham, 313 & 315 Broadway, New York.

Hulbert Bros. & Co., 23 W. 3d Street, New York.

Read, Wm. & Sons, Boston, Mass.

Stevens, J., Arms and Tool Co., Chippewa Falls, Mass.

Union Metallic Cartridge Co., 313 & 315 Broadway, N. Y.

## Auctioneers.

Bissell, E. Son & Co., N. Y.

## Axes.

Peck, A. G. & Co., Cohoes, N. Y.  
Warren Axe & Tool Wks., Warren, Pa.

## Axe Grasse.

Lovell, Tracy & Co., Hartford, Conn.

## Axes, Springs, &c., Manufacturers of.

Gantier Steel Dept. of Cambria Iron Co., Johnstown, Pa.

Wurster, F. W. & Co., Brooklyn, N. Y.

## Babbitt Metal.

Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.  
Crown Smelting Co., Chester, Pa.  
Hertz, T. & Son, St. Louis, Mo.  
Keys, W. W. & R. M. Co., Bridgeport, Conn.  
Reeves, Paul S., Philadelphia, Pa.

## Bakers and Roasters.

Bronson Supply Co., Cleveland, Ohio.

## Bale Ties.

Kilmer Mfg. Co., Newburg, N. Y.

## Band Saw Machines.

Cross & Speirs Machine Co., Waterbury, Conn.

## Barb Wire and Fence.

Consolidated Steel & Wire Co., St. Louis, Mo.  
Gantier Steel Dept. of Cambria Iron Co., Johnstown, Pa.  
Indiana Wire Fence Co., Crawfordsville, Ind.  
Kilmer Mfg. Co., Newburg, N. Y.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
Washburn & Moen Mfg. Co., Worcester.

## Bar Iron, Manufacturers of.

Atma-Standard Iron & Steel Co., Bridgeport, Conn.  
Allentown Rolling Mill, Allentown, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Montour Iron & Steel Co., Danville, Pa.  
Mahoning Valley Iron Co., Youngstown, Ohio.  
Sternbergh, J. H. & Son, Reading, Pa.

## Barrel Swings.

Leavitt Machine Co., Orange, Mass.

## Bellevue, Manufacturers of.

Bullock Bellevue Co., Cleveland, O.  
Scott, Geo. M., Chicago, Ill.

## Bells.

Bevin Bros. Mfg. Co., East Hampton.

## Belt Dressing.

Jos. Dixon Crucible Co., Jersey City, N. J.

## Belt Fasteners.

Bristol Mfg. Co., Waterbury, Conn.  
Clifton Mfg. Co., Cleveland, Ohio.

## Belting, Makers of.

Alexander Bros., 413 N. 3d., Phila.  
Jeffrey Mfg. Co., Columbus, O.  
Link-Belt Engineering Co., Phila., Pa.  
Main Belting Co., Philadelphia, Pa.  
N. Y. Belting & Packing Co., Ltd., N. Y.  
Roberts Mfg. Co., Pittsburgh, Pa.  
Shultz Belting Co., St. Louis, Mo.

## Bicycles.

Hingham, W. Co., Cleveland, Ohio.  
Eagle Bicycle Mfg. Co., Torrington, Ct.  
Hubert Bros. & Co., 20 W. 23d St. N. Y.  
Indiana Bicycle Co., Indianapolis, Ind.  
Covell, Jno. P., Arms Co., Boston, Mass.  
Rouse-Duryea Cycle Co., Peoria, Ill.

Pope Mfg. Co., Boston, Mass.  
Toledo Bicycle Co., Toledo, O.  
Western Wheel Works, Chicago, Ill.

## Bits and Braces.

Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

## Blocks, Tackle, Makers of.

Cleveland Block Co., Cleveland, O.  
Fulton Iron & Engine Works, Detroit, Mich.  
Toledo Block Works, Toledo, O.

## Blowers.

Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Huyet & Smith Mfg. Co., Detroit, Mich.  
Sturtevant, E. F. & Co., Boston, Mass.

## Boiler Plates.

Carbon Steel Co., Pittsburgh, Pa.  
McIlvain, Wm. & Sons, Reading, Pa.  
Lukens Iron & Steel Co., Coatsville, O.  
Pottstown Iron Co., Pottstown, Pa.

## Boilers, Copper.

Randolph & Clowes, Waterbury, Conn.

## Boilers, Steam.

Babcock & Wilcox Co., 30 Cortlandt, Edge Moor Iron Co., Wilmington.  
Fulton Steam Boiler Works and Fdry., Richmond, Ind.  
Harrison Safety Boiler Wks., Phila., Pa.  
Phoenix Iron Works Co., Meadville, Pa.  
Pollock, W. B. & Co., Youngstown, O.  
Southward Fdy. & Mch. Co., Phila., Pa.  
Wetherill, Robt. & Co., Chester, Pa.

## Bolt Cutters.

Chambers Bros. Co., Philadelphia.  
Howard Iron Works, Buffalo, N. Y.  
Porter, H. K., Boston, Mass.  
Reece, Edw. F., Greenfield, Mass.  
Wells Bros. Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

## Books.

Marine Review, Cleveland, Ohio.  
Williams, David, 90-102 Broad, N. Y.  
Wolcott & West, Syracuse, N. Y.

## Boring Machines.

Buckeye Mfg. Co., Union City, Ind.

## Boxes, Hdw. Shelf, &c.

Green, A. H., 23 Park Place, N. Y.  
Jones, Jesse & Co., Philadelphia, Pa.

## Box Straps and Corners.

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

## Brackets.

Atlas Mfg. Co., New Haven, Conn.

## Brake Shoes.

Sargent Co., Chicago, Ill.

## Brass, Manufacturers of.

Ansonia Brass & Copper Co., N. Y.  
David, John & Sons, 100 John, N. Y.  
Holmes, Booth & Haydens, N. Y.  
Plume & Atwood Mfg. Co., N. Y.  
Randolph & Clowes, Waterbury, Conn.  
Scovill Mfg. Co., Waterbury, Conn.  
Waterbury Brass Co., 296 B-way, N. Y.

## Brass Butt Hinges.

Tiebout, W. & J., 16 & 18 Chambers.

## Brass Founders.

East, Fox & Co., Pittsburgh, Pa.  
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.  
Cramp, Wm. & Sons, 3 & E. B. Co., Philadelphia, Pa.  
Emory, P. F. Mfg. Co., Springfield, Mass.  
Eynon-Evans Mfg. Co., Philadelphia.

## Brass Goods.

Brass Goods Mfg. Co., 88 Chambers.

## Bridge Builders.

Berlin Iron Bridge Co., East Berlin, Ct.  
Boston Bridge Works, Boston, Mass.  
Wrought Iron Bridge Co., Canton, O.

## Bronze (Tobin).

Ansonia Brass & Copper Co., 19-26 Cliff Street, N. Y.

## Brooms and Brushes.

Lay, Jos. & Co., Ridgeville, Ind.

## Builders' Hardware.

Deitz, A. E., 97 Chambers St., N. Y.  
Reading Hdw. Co., Reading, Pa.  
Yale & Towne Mfg. Co., Stamford, Ct.

## Butchers' Steels.

Chaillion, John & Sons, 85-89 Cliff St., N. Y.

## Butcher and Shoe Knives, Manufacturers of.

Chaillion, John & Sons, 85-89 Cliff St., N. Y.

## Butts and Hinges.

McKinney Mfg. Co., Alleghany, Pa.  
Sabin Machine Co., Montpelier, Vt.  
Stanley Works, New Britain, Conn.  
Tiebout, W. & J., 16 Chambers, N. Y.

## Cabinet Makers' Benches.

Grand Rapids Hand Screw Co., Grand Rapids, Mich.

## Calipers and Dividers.

J. Stevens Arms and Tool Co., Chippewa Falls, Mass.  
Starrett, L. S., Athol, Mass.

## Can Makers' Tools and Machines.

Niagara Stamping and Tool Co., Buffalo, N. Y.

## Car Axles.

Roberts, A. & P. & Co., Phila.

## Carboy Stands.

Allebrand & Wolf, Philadelphia, Pa.

## Car Wheels.

Whitney, A. & Sons, Phila.

## Carriage Hardware, Makers of.

Covert's Saddlery Works, Farmer, N. Y.  
Eccles, Richard, Auburn, N. Y.  
Scranton Forging Co., Scranton, Pa.  
Smith, H. D. & Co., Plantsville, Conn.  
Wilcox & Howe Co., Birmingham, Conn.

## Cartridge Reloading Tools.

Ideal Mfg. Co., New Haven, Conn.

## Casters, Wheel, &c.

Clark, G. P., Windsor Locks, Conn.

## Casting, Iron and Steel.

Ames Sword Co., Chicopee, Mass.  
Arcade Malleable Iron Co., Worcester, Mass.  
Booth, The Lloyd, Co., Youngstown, O.  
Burgess & Loxley, Buffalo, N. Y.

Seasons Foundry Co., Brooklyn, N. Y.

Cambria Steel Co., Cambria Iron Co., Johnstown, Pa.

Cheney, S. & Son, Manlius, N. Y.

Chester Steel Casting Co., Phila.

Chrome Steel Works, Brooklyn, N. Y.

Dayton Malleable Iron Co., Dayton, O.

Stieglitz & Henger Mfg. Co., St. Louis, Mo.

Eureka Cast Steel Co., Chester, Pa.

Flagg, Stanley G. & Co., Phila.

Garland Foundry Co., Cleveland, O.

Haight & Clark, Albany, N. Y.

Hammer & Co., Branford, Conn.

Herick, J. A., 234 Pearl St., N. Y.

Johnson Foundry Co., Johnstown, Pa.

Johnson, I. G. & Co., Spruysten Duvvyl.

Mahoning Fdry. & Mch. Co., Danville, Pa.

Palmer & De Moor, Cleveland, O.

Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.

Peerless Fdy Co., Philadelphia, Pa.

Sargent Co., Chicago, Bristol, Conn.

Shilling Fdy. Co., Columbus, O.

Spencer's, I. S., Sons, Guilford, Conn.

Standard Fdy. & Mfg. Co., Cleveland, O.

Standard Steel Casting Co., Thurlow, Pa.

Taylor Iron & Steel Co., High Bridge, N. J.

Totten & Borg, Iron & Steel Fdry Co., Pittsburgh, Pa.

Trenton Mal. Iron Co., Trenton, N. J.

Union Mfg. Co., 103 Chambers St., N. Y.

West Coxsackie Iron Fdry. Coxsackie, N. Y.

Wetherill, Robt. & Co., Chester, Pa.

## Chains.

Bradley & Co., Philadelphia.

Bridgeport Chain Co., Bridgeport, Conn.

Link-Belt Engineering Co., Phila., Pa.

McKay, Jas. & Co., Pittsburgh, Pa.

## Chimneys.

Phila. Engineering Works, Phila., Pa.

## Chisels, Manufacturers of.

Buck Bros., Millbury, Mass.

White, L. & I. J. Co., Buffalo, N. Y.

## Chucks.

Curman Chuck Co., Hartford, Conn.

Smith & Egg Mfg. Co., Bridgeport.

Skinner Chuck Co., New Britain, Conn.

Union Mfg. Co., 103 Chambers, N. Y.

Whitton, D. E. Mach. Co., New London, Conn.

## Churns.

Buckeye Churn Co., Sidney, O.

## Clamps.

Hammer & Co., Branford, Conn.

Le Count, C. W., So. Norwalk, Conn.

## Clipping Machines.

Hotchkiss, E. S., Bridgeport, Conn.

McCoy, Jos. F. & Co., 26 Warren St.

## Coal.

Barns, C. K. & Co., Philadelphia, Pa.

Wister, Francis, Philadelphia, Pa.

## Coffee and Spice Mills.

Sun Mfg. Co., Greenfield, O.

Waddell Wooden Ware Works, Greenfield, O.

## Coke.

Barns, C. K. & Co., Philadelphia, Pa.

Houston, C. B. & Co., Philadelphia, Pa.

Rainey, W. J., Cleveland, O.

Shibell, Geo. H. & Co., Chicago, Ill.

Wister, Francis, Philadelphia, Pa.

## Collections.

Hardware Board of Trade (Limited) 4 and 6 Warren, N. Y.

## Condensers.

Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

## Conveying Machinery.

Brown Hasting & Conveying Machine Co., Cleveland, Ohio.

Jeffrey Mfg. Co., Columbus, O.

Link Belt Engineering Co., Phila., Pa.

## Copper.

Ames Sword Co., Chicopee, Mass.

Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.

Hendricks Bros., 49 Cliff, N. Y.

New Haven Copper Co., 234 Pearl, N. Y.

Randolph & Clowes, Waterbury, Conn.

Wister, Francis, Philadelphia, Pa.

## Coppersmiths.

Emory, P. F. Mfg. Co., Springfield, Mass.

## Cordage.

Samson Cordage Works, Boston, Mass.

## Cork Screws.

Williamson, C. T. Wire Novelty Co., Newark, N. J.

## Corn Huskers.

Boss Mfg. Co., Kewanee, Ill.  
Hall & Ross Husking Glove Co., Chicago, Ill.  
Moore & Wickert, Green River, Ohio.

## Cornice Brakes.

Bertsch & Co., Cambridge City, Ind.

Robinson, J. M. & Co., Cincinnati, O.

## Corrugated Furnaces.

Continental Iron Wks., Brooklyn, N. Y.

## Corrugated Iron.

**Drop Presses.**

Ellis, E. W. Co., Brooklyn, N. Y.  
Crosby, G. A. & Co., Chicago, Ill.  
Ferracute Mch. Co., Bridgeton N. J.  
Miner & Peck Mfg. Co., New Haven, Conn.  
Robinson, J. M. & Co., Cincinnati, O.  
Stiles & Parker Press Co., Brooklyn, N. Y.  
Vulcan Iron Works, Chicago, Ill.  
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

**Dump Wagons.**

Storm Mfg. Co., Newark, N. J.

**Dust Beaters.**

Peabody & Parks, Troy, N. Y.

**Dynamite.**

New York Powder Co., 62 Liberty St., N. Y.

**Dynamos.**

C. & C. Electric Motor Co., 402 and 404 Greenwich St., N. Y.  
Detroit Dynamo Co., Detroit, Mich.  
Lovell Mfg. Co., Ltd., Erie, Pa.  
Zucker & Levett Chemical Co., 10 & 14 Grand St., N. Y.

**Edge Tools. Makers of.**

Snack Irons, Millbury, Mass.  
Butcher, W. & S., 135 Duane St., N. Y.  
Buffalo Edge Tool Wks., Buffalo, N. Y.  
Plumb, Fayette R., Philadelphia, Pa.  
Warren Axe & Tool Wks., Warren, Pa.  
White, L. & I. J. Co., Buffalo, N. Y.

**Egg Beaters.**

North Bros. Mfg. Co., Philadelphia.

**Electric Bells and Supplies.**

Ostrander, W. R. & Co., 204 Fulton St., New York  
Wollensak, J. F., Chicago, Ill.

**Electric Dynamo Machines.**

Hanson & Van Winkle Co., Newark, N. J.

**Electro-Platers.**

Boardman, L. & Son, East Haddam Ct.

**Elevators. Makers of.**

Link-Belt Engineering Co., Phila., Pa.  
Morris, Williams & Co., Phila., Pa.  
Salem Fdry & Mch. Co., Salem, Mass.

**Emery and Emery Wheels.**

Bell, Geo. E., 38 John St., N. Y.  
Grant Corundum Wheel Mfg. Co., Worcester, Mass.  
N. Y. Belting & Packing Co., Ltd., N. Y.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Springfield Emery Wheel Mfg. Co., Bridgeport, Conn.  
Sterling Emery Wheel Co., 174 Fulton St., New York.

**Enamels.**

Nubian Iron Enamel Co., Cragin, Ill.

**Engineers and Contractors.**

Aiken Henry, Pittsburgh, Pa.  
Artificial Gas Engineering Co., Pittsburgh, Pa.  
Herrick, J. A., 284 Pearl St., N. Y.  
Kennedy, Julian, Pittsburgh, Pa.  
Laughlin, Alex. & Co., Pittsburgh, Pa.  
Lean, D. R. Co., Pittsburgh, Pa.  
McClure, Amster & Co., Pittsburgh, Pa.  
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.  
Roberts, Frank, Philadelphia, Pa.  
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.  
Swindell, W. & Bros., Pittsburgh, Pa.  
Wetherow, Jas. P. Co., Pittsburgh, Pa.

**Engines, Gas.**

Otto Gas Engine Works, Phila., Pa.  
Rollason Gas Engine, Havemayer Bldg., N. Y.

**Engines, Steam. Makers of.**

Bass Foundry & Machine Works, Ft. Wayne, Ind.  
Buckeye Engine Co., Salem, O.  
Erie Engine Works, Erie, Pa.  
Lane & Bodley Co., Cincinnati, O.  
Norwalk Iron Works Co., So. Norwalk, Conn.  
Phila. Engineering Works, Phila., Pa.  
Phoenix Iron Wks. Co., Meadville, Pa.  
Shipman Engine Co., Boston, Mass.  
Southward Foundry and Machine Co., Phila., Pa.  
Tod, William & Co., Youngstown, O.  
Wetherill, Robt. & Co., Chester, Pa.

**Exhaust Tumblers.**

Sweester, W. A., Brookton, Mass.

**Expansion Belts.**

Boone, W. C. Mfg. Co., Boonton, N. J.  
Church, Isaac, Toledo, O.

**Faucets, Self-Measuring.**

Lane Bros., Poughkeepsie, N. Y.

**Faucets, Wooden. Makers of.**

Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.  
John Sommer's Son, Newark, N. J.

**Feed-Water Heaters.**

Davis, I. B. & Son, Hartford, Conn.  
Goubert Mfg. Co., 32 Cortlandt St., N. Y.  
Harrison Safety Boiler Wks., Phila., Pa.  
National Pipe Bending Co., New Haven, Conn.  
Webster, Warren & Co., Camden, N. J.  
Whitlock Coil Pipe Co., Elmwood, Conn.

**Fencing, Iron and Wire.**

Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Clinton Wire Cloth Co., Clinton, Mass.  
DeKalb Fence Co., DeKalb, Ill.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., Hartman Mfg. Co., Ellwood City, Pa.  
Kilmer Mfg. Co., Newburgh, N. Y.  
Mast, Foss & Co., Springfield, O.  
The Van Dorn Iron Works Co., Cleveland, O.  
Bellance Wire & Iron Wks., Milwaukee

**Files. Importers of.**

Moss, F. W., 80 John, N. Y.

**Files and Rasps. Manufacturers of.**

Arcade File Works, Anderson, Ind.  
Banker & White, Troy, N. Y.  
Barnett, G. & E., 41 & 43 Richmond Phila.  
Butcher, W. & S., 135 Duane St., N. Y.  
McCaffrey File Co., Philadelphia.  
Nicholson File Co., Providence R. I.

**Fire Brick. Makers of.**

Borgner, Cyrus, Philadelphia, Pa.  
Gardner, Jas. & Son, Cumberland, Md.  
Kreischer B. & Sons, Foot E. Houston, St.  
McLeod & Henry Co., Troy, N. Y.  
Maurer, H. & Son, 420 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Valentine, M. D. & Bro., Woodbridge.

**Fire Sets.**

Troy Nickel Works, Troy, N. Y.

**Fishing Tackle.**

Dame, Stoddard & Kendall, Boston, Mass.

**Flint and Emery Paper.**

Baeder, Adamson & Co., Phila., Pa.

**Flour Sifters.**

Meyers, F. J. Mfg. Co., Covington, Ky.

**Flower Stands.**

Cincinnati Mfg. Co., Cincinnati, O.

**Fodder Cutters.**

Silver Mfg. Co., Salem, O.

**Forges, Portable. &c.**

Bullock Bellows Co., Cleveland, O.  
Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Empire Portable Forge Co., Lansingburg, N. Y.  
Surtelant, B. F. Co., Boston, Mass.

**Forgings, Iron and Steel.**

Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Steel-Cambria Iron Co., Johnstown, Pa.  
Scranton Forging Co., Scranton, Pa.

**Foundry Facings.**

Paxson, J. W. & Co., Phila.  
S. Obermayer Co., Cincinnati, O.  
Smith, J. D. Fdy. Supply Co., Cin., O.

**Foundry Kiddles.**

Estey, W. S., 65 Fulton, N. Y.

**Foundry Supplies.**

Collins, Victor, Detroit, Mich.  
S. Obermayer Co., Cincinnati, O.  
Paxson, J. W. & Co., Philadelphia.  
Smith, J. D. Fdy. Supply Co., Cin., O.

**Friction Clutches.**

Keystone Clutch & Mch. Wks., Phila., Pa.  
Moore & White Co., Philadelphia, Pa.

**Friction Cone.**

Evans Friction Cone Co., Boston, Mass.

**Fruit Pickers.**

Cleveland Novelty Co., Cleveland, O.

**Fruit Presses.**

Enterprise Mfg. Co., Philadelphia, Pa.

**Furnaces, Gasoline.**

Burgess Soldering Fee. Co., Columbus, Ohio.

**Gas Producers.**

Wood, E. D. & Co., Philadelphia, Pa.

**Gas & Steam Fitters' Supplies.**

Pancoast, Henry B. & Co., Phila., Pa.

**Gauge, Rolling Mill.**

Haines Gauge Co., Philadelphia, Pa.

**Gear Cutters.**

D. E. Whiton Mach. Co., New London, Conn.

**Gears.**

Boston Gear Works, Boston, Mass.  
Gleason Tool Co., Rochester, N. Y.  
New Process Raw Hide Co., Syracuse, N. Y.  
Poole, Robt. & Son Co., Baltimore, Md.

**Glass Tubes.**

Ashcroft Mfg. Co., 111 Liberty St., N. Y.

**Glass Cutters.**

Monroe, S. G., Bristol, Conn.

**Glue.**

Baeder, Adamson & Co., Phila., Pa.  
Russia Cement Co., Gloucester, Mass.

**Grass Catchers.**

Supplee Hardware Co., Phila., Pa.

**Grinding and Polishing Machines.**

Herrick & Cowell, New Haven, Conn.  
Norton Emery Wheel Co., Worcester, Mass.  
Washburn Shops, Worcester, Mass.

**Grindstone Dressing Machinery.**

Blake & Johnson, Waterbury, Conn.

**Grindstones.**

Cleveland Stone Co., Cleveland, O.

**Gun Implements.**

Union Hdw. Co., Torrington, Conn.

**Gunpowder. Makers of.**

Lafin & Rand Powder Co., 29 Murray St., N. Y.

**Hand Carts.**

Lansing Wheelbarrow Co., Lansing, Mich.

**Handles.**

New Process Raw Hide Co., Syracuse, N. Y.  
New York Mallet and Handle Wks., 456 E. Houston St., N. Y.

**Hand Screws.**

Grand Rapids Hand Screw Co., Grand Rapids, Mich.

**Hangers, Door.**

Crunk Hanger Co., Elmira, N. Y.  
Lane Bros., Poughkeepsie, N. Y.  
Victor Mfg. Co., Newburyport, Mass.

**Hardware Comm'n Merchants.**

Doscher, Martin, 88 Chambers, N. Y.  
Field, Alfred & Co., 98 Chambers St., N. Y.  
Graham, John H. & Co., 111 Chambers St., New York.  
Jacobus, W. H., 90 Chambers, N. Y.

**Hardware Manufacturers.**

Hotchkiss, E. S., Bridgeport, Conn.  
Stearns, E. C. & Co., Syracuse, N. Y.  
Union Mfg. Co., 103 Chambers, N. Y.  
Yale & Towne Mfg. Co., Stamford, Conn.

**Hardware Mfrs. Agents.**

Bingham, W. Co., Cleveland, O.  
Graham, John H. & Co., 113 Chambers, N. Y.  
McCoy, Jos. F. Co., 28 Warren St., N. Y.  
Sickles Sweet & Lyon, 35 Barclay, N. Y.  
Underhill, Clinch & Co., 94 Chambers St., N. Y.

**Hardware Specialties.**

Acme Shear Co., Bridgeport, Conn.  
Belden Machine Co., New Haven, Conn.  
Clark Mfg. Co., Buffalo, N. Y.  
Empire Portable Forge Co., Lansingburg, N. Y.  
Enterprises Mfg. Co., Philadelphia, Pa.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Gwinnett Mfg. Co., Hamilton, O.  
Haines & Zimmerman, Phila., Pa.  
Hart, H. C. Mfg. Co., Detroit, Mich.  
Henn, A. S. & Co., New Haven, Conn.  
Johnson, S. C., Racine, Wis.  
Knap & Cowles Mfg. Co., Bridgeport, Conn.  
New Britain Hdw. Mfg. Co., New Britain, Conn.  
North Bros. Mfg. Co., Philadelphia, Pa.  
Peabody & Parks, Troy, N. Y.  
Shepard, Sidney & Co., Buffalo, N. Y.  
Weiland, Chas., 145 Chambers St., N. Y.  
Wilson, Fred, Worcester, Mass.  
Wire Goods Co., Worcester, Mass.  
Underhill, Clinch & Co., 94 Chambers Street, N. Y.

**Hardware, Yacht and Ship.**

Ferdinand, L. W. & Co., Boston, Mass.

**Harness Snaps.**

Covert Mfg. Co., West Troy, N. Y.  
Coverly's Saddlery Wks., Farmer, N. Y.  
Fitch, W. & E. T., New Haven, Conn.

**Hay Knives.**

Holt, Hiram, Co., E. Wilton, Me.

**Hoisting Machines.**

Box, Alfred & Co., 314 Green, Phila.  
Brown Hoisting & Conveying Mch. Co., Cleveland, O.  
Copeland & Bacon, 85 Liberty St., N. Y.  
Fulton Iron & Engine Wks., Detroit, Mich.  
Harrington, E., Son & Co., Phila.  
Lane Bros., Poughkeepsie, N. Y.  
Lidgerwood Mfg. Co., 96 Liberty, N. Y.  
Maris & Beechey, Philadelphia.  
Morse, Mfg. & Fdy. Co., Milwaukee, Wis.  
Morse, Williams & Co., Phila.  
Sellers, Wm. & Co., Phila. and N. Y.  
Speidel, J. G., Reading, Pa.  
Yale & Towne Mfg. Co., Stamford, Ct.

**Hollow Ware.**

Bronson Supply Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.  
Stuart & Peterson Co., Phila., Pa.

**Hollow Ware, Aluminum.**

Illinois Pure Aluminum Co., Lemont, Ill.

**Horse and Barbers' Clippers.**

Hotchkiss, E. S., Bridgeport, Conn.

**Horse Nails. Makers of.**

National Horse Nail Co., Vergennes, Vt.

**Horse and Mule Shoes. Makers of.**

Bryden Horse Shoe Co., Catsaqua, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Diamond State Iron Co., Wilmington, Del.  
Old Dominion Iron & Nail Works Co., Richmond, Va.  
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.  
Rhode Island Perkins Horse Shoe Co., Providence.  
Shoenberger & Co., Pittsburgh, Pa.  
Standard Horse Shoe Co., Boston, Mass.

**Hose.**

Cleveland Rubber Co., Cleveland, O.  
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

**Hydrants, &c.**

McLean, John, 296 & 298 Monroe, N. Y.

**Hydraulic Jacks.**

Dudgeon, Richard, 24 Columbia, N. Y.  
Watson & Scillman, 204 E. 43d, N. Y.

**Ice-Cream Freezers.**

North Bros. Mfg. Co., Phila., Pa.  
Packer, C. W., Philadelphia, Pa.  
White Mountain Freezer Co., Nashua, N. H.

**Ice Shavers.**

Enterprise Mfg. Co., Philadelphia, Pa.

**Injectors.**

Brynon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., New York  
Sherwood Mfg. Co., Buffalo, N. Y.

**Insurance, Boiler.**

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

**Iron and Steel, Swedish.**

Lundberg, Gustaf, Boston, Mass.  
Milne, A. & Co., 1 Broadway, N. Y.

**Iron Commission Brokers.**

Corning, Edw. & Co., 39 B'way, N. Y.  
Cotton, Bradley & Co., Philadelphia.  
Etting, Edw. J., Philadelphia.  
Hokan, John L. & Co., Philadelphia, Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Levis, Henry & Co., Philadelphia.  
Keeley, Jerome & Co., Philadelphia.  
Lea, J. Tatnall & Co., Philadelphia.  
Mohr, J. J., 480 Walnut, Philadelphia.  
Mann, E. R. & Co., Philadelphia.  
Pilling & Crane, Philadelphia, Pa.  
Sibell, Geo. H. & Co., Chicago, Ill.  
Wister, L. & R. & Co., Phila., Pa.

**Iron Ore.**

Naylor & Co., 45 Wall, N. Y.  
Pickands, Brown & Co., Chicago, Ill.  
Pullman, J. Wesley, Phila., Pa.  
Samuel, Frank, Philadelphia, Pa.

**Iron, Merchants.**

Barnes, C. K. & Co., Philadelphia, Pa.  
Borden & Lovell, 70 West, N. Y.  
Bussettus & Cunliffe, Philadelphia.  
Corning Edw. & Co., 29 B'way, N. Y.  
Cott, Justice, Jr., Philadelphia.  
Cotton, Bradley & Co., Philadelphia.  
Hoffman, J. W. & Co., Philadelphia.  
Leonard, J., 446 West St., N. Y.  
Navlor & Co., 45 Wall St., N. Y.  
Nicolls, Wheeler & Co., Philadelphia.  
Ogden & Wallace, 88 Elm St., N. Y.  
Pickands, Brown & Co., Chicago, Ill.  
Pierson Co., 22 Broadway, N. Y.  
Richards, D. W. & Co., 88 Mangin St., N. Y.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wilson, E. H. & Co., Philadelphia.

**Iron, Importers.**

Abbott Wheelock & Co., N. Y. and Boston  
Lundberg, Gustaf, Boston, Mass.

**Iron, Sheet. Manufacturers of.**

Cambridge Iron & Steel Co., Cambridge  
W. Dewees Wood Co., Lim., McKeesport, Pa.

**Ironwork, Ornamental.**

Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
Mast, Foss & Co., Springfield, O.  
The Van Dorn Iron Works Co., Cleveland, O.

**Keys.**

Wollensak, J. F., Chicago, Ill.

**Ladies.**

Detroit Fdy. Equipment Co., Detroit, Mich.

**Lamp Stoves.**

Glazier Stove Co., Chelsea, Mich.

**Lanterns.**

Dietz, R. E. Co., 60 Lighthouse St., N. Y.  
Ohio Lantern Co., Tiffin, Ohio.  
Steam Gauge & Lantern Co., Syracuse, N. Y.

**Lathes.**

Draper Machine Tool Co., Worcester, Mass.  
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Lathing, Wire.**

Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Laundry Machines.**

Jonsson, S. C., Racine, Wis.

**Lawn Mowers.**

Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.  
Champion Mfg. Co., Richmond, Ind.  
Coldwell Lawn Mower Co., Newburgh, N. Y.  
F. & N. Mfg. Co., Richmond, Ind.  
Hewley, M. C., Richmond, Ind.  
Lape, W. E., Syracuse, N. Y.  
Mast, Foss & Co., Springfield, O.  
Stearns, E. C. & Co., Syracuse, N. Y.  
Supplee Hdw. Co., Phila., Pa.

**Lawn Rakes.**

Schaeffer & Co., Dayton, Ohio.  
Syracuse Specialty Mfg. Co., Syracuse, N. Y.

**Lawn Sprinklers.**

Ette & Henger Mfg. Co., St. Louis.  
McGowan, John H. Co., Cincinnati, O.

**Lawn Sweepers.**

Lape, W. E., Syracuse, N. Y.

**Lemon Squeezers.**

Ripley Mfg. Co., Unionville, Conn.

**Letters and Figures, Metallic.**

White, A. A. & Co., Providence, R. I.

**Letters, Paper.**

Tablet & Ticket Co., Chicago, Ill.

**Levels.**

Davis & Cook, Watertown, N. Y.  
Richardson, C. F., &



- Machinery.**  
Am. Tool Works, Cleveland, Ohio.  
Barnes, W. F. & John, Rockford, Ill.  
Sement, Miles & Co., Philadelphia, Pa.  
Bigelow, C. E., 45 Dey, N. Y.  
Bignall & Keeler Mfg. Co., St. Louis.  
Birmingham Iron Foundry, Birmingham, Conn.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Boget, Jno. L., Flushing, N. Y.  
Briggs, Marvin, 12 Broadway, N. Y.  
Carlin's Sons, Thos., Allegheny, Pa.  
Cinn. Milling Mch. Co., Cincinnati, Ohio.  
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.  
Coulter & McKensie Mch. Co., Bridgeport, Conn.  
Cruikshank, D. B., Providence, R. I.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Fitchburg Mch. Works, Fitchburg, Mass.  
Garvin Mch. Co., Leight & Canal Sts.  
Gould & Eberhardt, Newark, N. J.  
Hamilton Mch. Tool Co., Hamilton, O.  
Harrington, E. Son & Co., Phila.  
Henderer, A. L., Wilmington, Del.  
Hendey Machine Co., Torrington, Ct.  
Kenley Mch. Tool Wks., Richmond, Ind.  
Ell, Clarke Co., Boston, Mass.  
Ingersoll Milling Machine Co., Rockford, Ill.  
Johnson, Israel H., Jr., & Co., Phila.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Kelly, Daniel, Phila., Pa.  
Lodge & Shipley Mch. Tool Works, Cincinnati, O.  
Lovegrove & Co., Philadelphia, Pa.  
McCabe, J. J., 68 Cortlandt, N. Y.  
Machinists Supply Co., Rochester, N. Y.  
Manville, E. J. Mch. Co., Waterbury, Conn.  
National Machinery Co., Tiffin, Ohio.  
Newark Mch. Tool Works, New Ark, N. J.  
New Haven Mfg. Co., New Haven, Conn.  
New York Mach'g Depot, N. Y.  
Niles Tool Wks., 188 Liberty St., N. Y.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.  
Place, Geo., 120 Broadway, N. Y.  
Poole, Robt. & Son Co., Baltimore, Md.  
Powell Planer Co., Worcester, Mass.  
Pratt & Whitney Co., Hartford, Conn.  
Prentiss Tool & Supply Co., N. Y.  
Scranton Supply & Mchry. Co., Scranton, Pa.  
Sellers, Wm. & Co., Phila.  
Seyler's Sons L. F., Philadelphia, Pa.  
Steppe, J. & Co., Cincinnati, O.  
Stow Flexible Shaft Co., Ltd., Phila.  
Toomey, Frank, Philadelphia, Pa.  
Wetherill, Robert & Co., Chester, Pa.  
Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacture.**  
Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**  
Loring Coes & Co., Worcester, Mass.
- Machine Tools.—See Machinery.**
- Machine Work.**  
Fapping, J., 58th St., & 11th Ave., N. Y. City.
- Machinists' Scales.**  
Coffin & Leighton, Syracuse, N. Y.  
Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**  
King, J. M. & Co., Waterford, N. Y.  
Sellers, Wm. & Co., Inc., Phila.
- Mallets.**  
N. Y. Mallet & Handle Works, N. Y.
- Mangles.**  
Johnson, S. C., Racine, Wis.
- Manufacturing Sites.**  
Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
- Measuring Tapes.**  
Keuffel & Esser Co., 127 Fulton St., N. Y.  
Lufkin Rule Co., Saginaw, Mich.
- Meat Cutters.**  
Enterprise Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**  
Correspondence School of Mechanics, Scranton, Pa.
- Metals.**  
Fearing, Wm. S., 100 Chambers, N. Y.  
Hendricks Bros., 49 Cliff, N. Y.  
Taylor & Co., 45 Wall, N. Y.
- Metal Brokers.**  
American Metal Co., N. Y.
- Metalurgists.**  
Britton J. Blodgett, Phila.
- Milling Machines.**  
Cin. Milling Mch. Co., Cincinnati, Ohio.  
Ingersoll Milling Machine Co., Rockford, Ill.
- Mining Knives.**  
Palmer Hdw. Mfg. Co., Troy, N. Y.
- Mine Lamps.**  
Darby, Edw. & Sons, Phila., Pa.  
Leonard, R. E., Scranton, Pa.  
Leonard, T. F., Scranton, Pa.
- Mining Sengens.**  
Harrington & King Perforating Co., Chicago, Ill.  
Howard & Morse, 45 Fulton, N. Y.
- Mirrors.**  
Rice, C. F., Chicago, Ill.
- Molding Sand.**  
Obermayer, S. Co., Cincinnati, O.  
Paxon, J. W. & Co., Phila.
- Motors, Water and Electric.**  
C. & O. Electric Motor Co., 402 and 404 Greenwich St., N. Y.  
Dallett, Thos. H. & Co., Phila., Pa.
- Wall Machinery.**  
Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nails (Cut) and Spikes.**  
Sorden & Lovell, 70 West, N. Y.  
Cumberland Nail & Iron Co., Phila.  
Oxford Iron Co., 81 Washington, N.  
Pottstown Iron Co., Pottstown, Pa.  
Siverside Iron Wks., Wheeling, W. Va.
- Neck Yokes.**  
Johnson, S. C., Racine, Wis.
- Nickel Platers' Supplies.**  
Hanson & Van Winkle Co., Newark, N. J.  
Zaoker & Lovett Chemical Company, 10 to 14 Grand St., N. Y.
- Norway Shapes, Rollers of.**  
Rowland, William & Harvey, Frankford, Philadelphia
- Nut Machines.**  
Dunham Nut Mch. Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**  
American Bolt Co., Lowell, Mass.  
American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.  
Haskell, Wm. H. Co., Pawtucket, R. I.  
Mt. Carmel Bolt Co., Mt. Carmel, Conn.  
Port Chester Bolt and Nut Co., Chester, N. Y.  
Russell, Burdall & Ward, Port Chester, N. Y.  
Sternbergh, J. H. & Son, Reading, Pa.  
Wilson, J. Fred., Worcester, Mass.  
Wm. H. Haskell Co., Pawtucket, R. I.
- Oil Cans and Lubricators.**  
Sherwood Mfg. Co., Buffalo, N. Y.
- Oilers.**  
Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Stones.**  
Pike Mfg. Co., Pike Station, N. H.
- Oil Stoves.**  
Glazier Stove Co., Chelsea, Mich.
- Ores.**  
Wister, Francis, Philadelphia, Pa.
- Or Shoes.**  
Scranton Forging Co., Scranton, Pa.
- Packing.**  
Billington, Jas. H. & Co., Phila., Pa.  
Morrison, Robt., St. Louis, Mo.  
N. Y. Belting & Packing Co. Ltd., N. Y.
- Packings.**  
Ames Sword Co., Chicopee, Mass.  
Fram, E. T., Lancaster, Pa.  
Hillebrand & Wolf, Phila., Pa.  
Miller Lock Co., Philadelphia, Pa.
- Paint.**  
Dixon, Jos. Crucible Co., Jersey City, N. J.
- Paint Burners.**  
Dangler Stove & Mfg. Co., Cleveland, O.
- Paint Cans.**  
Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.
- Patent Solicitors.**  
Howson & Howson, Phila. & Wash'gton.  
Jenner, H. W. T., Washington, D. C.  
Stocking, E. B., Washington, D. C.
- Perforated Metal.**  
Clinton Wire Cloth Co., Clinton, Mass.  
Harrington & King Perforating Co., Chicago, Ill.  
Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**  
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia.
- Phosphor Tin.**  
Crescent Phosphorized Metal Co., Philadelphia, Pa.  
Crosby Steam Gage & Valve Co., Boston, Mass.  
Salk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**  
Plumb, Fayette K., Philadelphia, Pa.
- Pig Iron.**  
Houston, C. B. & Co., Philadelphia, Pa.  
Mann, Edwin R., Philadelphia, Pa.  
Montour Iron & Steel Co., Danville, Pa.  
Taylor & Co., 45 Wall, N. Y.  
Pickands, Brown & Co., Chicago, Ill.  
Pilling & Crane, Philadelphia, Pa.  
Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**  
Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**  
Vulcan Iron Wks., Chicago, Ill.
- Pipe, Bent.**  
National Pipe Bending Co., New Haven
- Pipe Cutting and Threading Machines.**  
Bignall & Keeler Mfg. Co., St. Louis, Mo.  
Merrill Mfg. Co., Toledo, O.  
Fancoast Henry B. & Co., Philadelphia.  
Sander's Sons, D., Yonkers, N. Y.
- Pipe Grips.**  
Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**  
McNab & Harlan Mfg. Co., N. Y.
- Pipe, Water and Gas. Makers of.**  
Cumberland Nail & Iron Co., Phila.  
Donaldson Iron Co., Emmaus, Pa.  
Riverside Iron Works, Wheeling, W. Va.  
Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**  
Buck Bros., Millbury, Mass.
- Planes, Manufacturers of.**  
Stanley Rule & Level Co., N. Y.
- Plate, Iron and Steel, Mfrs of.**  
Eas-Standard Iron & Steel Co., Bridgeport, Ct.  
Hartens Iron & Steel Co., Coatesville, Pa.  
Mahoning Valley Iron Co., Youngstown, Ohio.  
Moorehead-McLean Co., Pittsburgh, Pa.  
McClain & Sons, Reading, Pa.  
Pottsville Iron Co., Pottsville, Pa.  
Pottsville Iron & Steel Co., Pottsville, Pa.  
Singer, Nimick & Co., Pittsburgh, Pa.  
The Mahoning Valley Iron Co., Youngstown, O.  
Wolman Iron & Steel Co., Thurlow, Pa.  
Woodman Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**  
Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.
- Pokers and Lifters.**  
Troy Nickel Works, Troy, N. Y.
- Polishing Machines.**  
Watson & Stillman, 204 E. 43d, N. Y.
- Polishing Wheel.**  
La Massena, C. E. & Co., Newark, N. J.
- Post Hole Diggers.**  
Buckeye Mfg. Co., Union City, Ind.  
Kohler, F. E. & Co., Canton, O.  
Water, L. R. & Co., Philadelphia, Pa.
- Putty Nettings.**  
Barnum, E. T., Detroit, Mich.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
J. N. Wire Cloth Co., Trenton, N. J.  
"Silver Finish."  
Tyler Wire Wks. Co., W. S., Cleveland, O.  
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**  
Lafin & Rand Powder Co., 29 Murray New York Powder Co., 62 Liberty St., N. Y.
- Power Hack Saws.**  
Millers Falls Co., 93 Reade St., N. Y.
- Pewer Hammers.**  
Selden Mach. Co., New Haven, Conn.  
Oienelt & Eisenhardt, Philadelphia.  
Jenkins & Lince, Belton, Pa.  
Long & Allstatter Co., Hamilton, Ohio.
- Presses, Dies, &c.**  
E. W. Bliss Co., Brooklyn, N. Y.  
Crosby, G. A. & Co., Chicago, Ill.  
Ferracuti Mch. Co., Bridgeport, N. J.  
Niagara Stamping & Tool Co., Buffalo, N. Y.  
Stark Mch. & Tool Co., Buffalo, N. Y.  
Stiles & Parker Press Co., Brooklyn, N. Y.  
Waterbury Mch. Co., Waterbury, Conn.
- Presses, Power, Makers of.**  
Bliss, E. W. Co., Brooklyn, N. Y.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Merriman, A. H., Meriden.  
Niagara Stamping and Tool Co., Buffalo, N. Y.  
Robinson, J. M. & Co., Cincinnati, O.  
Stark Mch. & Tool Co., Buffalo, N. Y.  
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.
- Pulleys.**  
Keystone Clutch Mch. Wks., Phila., Pa.  
Reeves Pulley Co., Columbus, Ind.
- Pulley Fixings.**  
Foley, J. W. & Co., Cincinnati, O.
- Pulverizing Mill.**  
Bradley Fertilizer Co., Boston, Mass.
- Pumping Machinery.**  
Coulter & McKensie Mch. Co., Bridgeport, Conn.  
Dean Bros. Steam Pump Works, Indianapolis, Ind.  
Hooker Corliss Steam Pump Co., Chicago, Ill.  
Lucas, C. O. & Co., Greenville, Ohio.  
McGowan, J. R. & Co., Cincinnati, O.  
Maslin, J. & Son, Jersey City, N. J.  
Norwalk Iron Wks. Co., So. Norwalk, Conn.  
Southward Eddy & Mch. Co., Phila.  
Valley Pump Wks., Easthampton, Mass.  
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Pumps, Makers of.**  
Bellevue Pump Co., Bellevue, Iowa.  
Belmont Co., Salem, O.  
Douglas, W. & B., Middletown, Conn.  
Mast, Foss & Co., Springfield, O.  
Myers, F. E. & Bro., Ashland, O.
- Punches and Shears, Hand and Power.**  
Bertsch & Co., Cambridge City, Ind.  
E. W. Bliss Co., Brooklyn, N. Y.  
Cockburn Barrow & Mch. Co., Jersey City, N. J.  
Crosby, G. A. & Co., Chicago, Ill.  
Ferracuti Mch. Co., Bridgeport, N. J.  
Hanoer, A. L., Wilmington, Del.  
Long & Allstatter Co., Hamilton, Ohio.  
Niagara Stamping and Tool Co., Buffalo, N. Y.  
Robinson, J. M. & Co., Cincinnati, O.  
Stark Mch. & Tool Co., Buffalo, N. Y.  
Stiles & Parker Press Co., Brooklyn, N. Y.  
Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.  
Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**  
Perry, W. H. & Co., Providence, R. I.  
Schwarzenberg Bros. & Co., Cleveland, O.
- Rat and Mouse Traps.**  
Burditt & Williams, Boston, Mass.  
Estey, W. S. & Co., N. Y.  
Ripley Mfg. Co., Unionville, Conn.  
Sun Mfg. Co., Greenfield, O.
- Razors.**  
Butcher, W. & S., 135 Duane St., N. Y.  
Curley, J. & Bro., 6 Warren St., N. Y.  
Electric Cutlery Co., 113 Chambers, N. Y.  
Schmitz, E. Lothar, 92 Reade St., N. Y.  
J. R. Torrey Razor Co., Worcester, Mass.
- Reels.**  
Hendryx, A. B. Co., New Haven, Conn.
- Refrigerator Door Fasteners.**  
Conroy, F. J. & Co., Philadelphia.
- Rivets.**  
Blake & Johnson, Waterbury, Conn.  
Burditt & Williams, Boston, Ind.  
Burdett Iron Co., Tr. Y., N. Y.  
Cobb & Drew, Plymouth, Mass.  
Henderson, Jas. S., 165 Greenwich, N. Y.  
Plymouth Mills, Plymouth, Mass.  
Sternbergh, J. H. & Son, Reading, Pa.  
Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**  
Adt, Jno. & Sons, New Haven, Conn.
- Rock Drills.**  
Fenna, Diamond Drill & Mfg. Co., Erie, Pa.  
Band Drill Co., 23 Park Place, N. Y.
- Rolling Mill Machinery.**  
Birmingham Iron Fdry, Birmingham, Conn.  
Booth, The Lloyd Co., Youngstown, O.  
Leachburg Foundry & Mch. Co., Pittsburgh, Pa.  
Mahoning Fdry & Mch. Co., Danville, Pa.  
Morgan Construction Co., Worcester, Mass.  
Robinson-Rea Mfg. Co., Pittsburgh.  
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.  
Tretthwey Mfg. Co., Pittsburgh, Pa.  
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Roll Lathes.**  
Totten & Hogg Iron & Steel Fdry Co., Pittsburgh, Pa.
- Rolls, Chilled, Sand and Steel.**  
Booth, The Lloyd Co., Youngstown, O.  
Garrison, A. Fdry Co., Pittsburgh, Pa.  
Johnson Foundry Co., Johnstown, Pa.  
Seaman, Sleeth & Black, Pittsburgh.  
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
- Roofing.**  
Berlin Iron Bridge Co., E. Berlin, Conn.  
Boston Bridge Works, Boston, Mass.  
Cambridge Roofing Co., Cambridge, O.  
Johns, H. W. Mfg. Co., 87 Maiden Lane
- Rope and Web Goods.**  
Covert Mfg. Co., West Troy, N. Y.  
Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**  
Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**  
Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**  
Keuffel & Esser Co., 127 Fulton St., N. Y.  
Lufkin Rule Co., Saginaw, Mich.  
Standard Tool Co., Athol, Mass.  
Stanley Rule & Level Co., 29 Chambers, N. Y.
- Sand Paper.**  
Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**  
Fullman Sash Balance Co., Rochester, N. Y.  
Vanderbilt Sash Balance Co., Canandaigua, N. Y.
- Sash Cords and Chains.**  
Morton, Thos., 65 Elizabeth, N. Y.  
Ossawa Mills Co., Norwich, Conn.  
Samson Cordage Works, Boston, Mass.  
Smith & Egge, Mfg. Co., Bridgeport, Cincinnati Corrugating Co., Piqua, O.
- Sash Fasteners.**  
Wooster, F. V., Boston, Mass.
- Sash Locks.**  
Ives, H. B. & Co., New Haven, Conn.
- Sash Pulleys.**  
Empire Portable Forge Co., Lansingburgh, N. Y.  
Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Pulley Marker.**  
Skelly, J. W. & Son, Bristol, Conn.
- Sash Weights.**  
Brown, E. E. & Co., Philadelphia, Pa.
- Sash Weight Fasteners.**  
Skelly, J. W. & Son, Bristol, Conn.
- Saws, Makers of.**  
Diston, Henry & Sons, Phila., Pa.  
Hiles, C. A. & Co., 339-338 Carroll Ave, Chicago, Ill.  
National Saw Co., 96 Reade St., N. Y.  
Simonds Mfg. Co., Fitchburg, Mass.
- Saw Handles.**  
Gwinner Mfg. Co., Hamilton, O.
- Saw Sets.**  
Kohler, F. E. & Co., Canton, Ohio.  
Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Scales, Manufacturers of.**  
Buffalo Scale Co., Buffalo, N. Y.  
Chastillon, John & Sons, 35-39 Cliff, N. Y.
- Scrapers, Road.**  
Am. Steel Scraper Co., Sidney, Ohio.  
Kilbourne & Jacobs Mfg. Co., Columbus, O.  
Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**  
Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screens, Door and Window.**  
Queen Anne Screen Co., Burlington Vt.
- Screw Cutting Machinery.**  
Wells Bros. & Co., Greenfield, Mass.  
Willey & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**  
Brown, R. H. & Co., New Haven, Conn.  
Capitol Mfg. Co., Chicago, Ill.  
Mayhew, H. H. Co., Shelbourne Falls, Mass.
- Screw Plate and Pipe Cutter.**  
Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**  
American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.  
Wm. H. Haskell Co., Pawtucket, Miles, J. S., 205 Quarry, Philadelphia.  
National Screw & Tack Co., Cleveland, Ohio.  
Reynolds & Co., New Haven, Conn.  
Worcester Machine Screw Co., Worcester, Mass.
- Seroll Saws.**  
Barnes, W. F. & John, Rockford, Ill.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Set the Stones and Whetstones.**  
Pike Mfg. Co., Pike Station, N. H.  
Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**  
Cresson, Geo. V. Co., Philadelphia, Pa.  
Fairmount Mch. Co., Philadelphia, Pa.  
Fittsimons & Co., Cleveland, Ohio.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Stow Mfg. Co., Binghamton, N. Y.
- Shaped Iron and Steel, Manufacturers of.**  
Eas-Standard Iron & Steel Co., Bridgeport, O.

See Alphabetical Index, Pages 107 &amp; 108.



- Allentown Rolling Mill.** Allentown, Pa.  
**Illinois Steel Co.,** Chicago, Ill.  
**Lockhart Iron & Steel Co.,** Pittsburg, Pa.  
**Passaic Rolling Mill Co.,** Paterson, N.J.  
**Pottsville Iron & Steel Co.,** Pottsville, Pa.  
**Roberts, A. & P. & Co.,** Phila., Pa.  
**The Phoenix Iron Co.,** Phila., Pa.  
**Tudor Iron Works,** St. Louis, Mo.
- Shears and Scissors.**  
**Aame Shear Co.,** Bridgeport, Conn.  
**Heinrichs, R. Sons Co.,** Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**  
**Etna-Standard Iron and Steel Co.,** Bridgeport, O.  
**Cambridge Iron & Steel Co.,** Cambridge, Ohio.  
**Chess Bros.,** Pittsburg, Pa.  
**Mahoning Valley Iron Co.,** Livingston, Ohio.  
**Moorehead-McCleane Co.,** Pittsburg, Pa.  
**Pierson & Co.,** 29 Broadway, N. Y.  
**Reilly, John W.,** Fort Hunter P. O., Pa.  
**Singer, Nimick & Co., Ltd.,** Pittsburg, Pa.  
**The Mahoning Valley Iron Co.,** Youngstown, O.  
**Alan Wood Co.,** Philadelphia, Pa.  
**W. Dewees Wood Co.,** McKeesport, Pa.
- Sheet Metal Work.**  
**Clark & Cowles,** Plainville, Conn.
- Sheet Zinc.**  
**Mathlessen & Hegeler Zinc Co.,** La Salle, Ill.
- Shelf Brackets.**  
**Koch, A. B. & Co.,** Peoria, Ill.
- Sinks.**  
**Douglas, W. & B.,** Middletown Conn.
- Skates, Ice.**  
**Dame, Stoddard & Kendall,** Boston, Mass.  
**Sickels, Sweet & Lyon,** 85 Barclay St., N. Y.  
**Winslow, Sam'l, Skate Mfg. Co.,** Worcester, Mass.
- Skates, Roller.**  
**Henley, M. C.,** Richmond, Ind.  
**Union Hardware Co.,** Torrington, Conn.  
**Winslow, Sam'l, Skate Mfg. Co.,** Worcester, Mass.
- Smelting Works.**  
**Reeves, Paul S.,** 760 S. Broad, Phila.
- Speaking Tubes.**  
**Ostrander, W. R. & Co.,** 204 Fulton St., N. Y.  
**Wollensak, J. F.,** Chicago, Ill.
- Specialties, Pat. Articles.**  
**Konigsloew, O.,** Cleveland, O.
- Speed Indicators.**  
**Church & Sleight,** 103 Fulton St., N. Y.
- Spelter.**  
**Mathlessen & Hegeler Zinc Co.,** La Salle, Ill.
- Spoons and Forks.**  
**Boardman, L. & Son,** New Haddam, Conn.  
**Holmes & Edwards Silver Co.,** Bridgeport, Conn.  
**Rogers, The Wm. Mfg. Co.,** Hartford, Conn.  
**Rogers & Hamilton Co.,** Waterbury, Conn.
- Sporting Goods.**  
**Hartley & Graham,** 313-315 B'way, N. Y.
- Springs.**  
**American Spiral Spring Co.,** Pittsburg, Pa.  
**Dunbar Bros.,** Bristol, Conn.  
**Miller & Van Winkle,** Brooklyn, N. Y.  
**Morgan Spring Co.,** Worcester, Mass.  
**Nourse, Fred. Co.,** 315 to 319 E. 22d St., N. Y.  
**Roland, Wm. & Harvey,** Phila., Pa.  
**Sabin Machine Co.,** Montpelier, Vt.  
**Tuck Mfg. Co.,** Brockton, Mass.  
**Washburn & Moen Mfg. Co.,** Worcester, Mass.  
**Wolf, R. H. & Co., Ltd.,** 118th St. and Harlem River, N. Y.
- Spring Hinges.**  
**Sardley, J.,** 149 & 151 Baxter St., N. Y.  
**Fullman Sash Balance Co.,** Rochester, N. Y.  
**Stover Mfg. Co.,** Freeport, Ill.  
**Van Wagoner & Williams Co.,** 14 Warren St., N. Y.
- Spring Keys and Cotter.**  
**Whitman & Barnes Mfg. Co.,** Syracuse, N. Y.
- Sprinklers.**  
**Smith, Oliver A.,** Clarkston, Mich.
- Stamped Ware.**  
**Am. Stamping Co.,** 104 & 106 John St., New York
- Stamping Works.**  
**Cleveland Stamping & Tool Co.,** Cleveland, O.
- Staples.**  
**Cobb & Drew,** Plymouth, Mass.  
**Titchener E. H. & Co.,** Binghamton, N. Y.
- Steam Gauges.**  
**Ashcroft Mfg. Co.,** 111 Liberty St., N. Y.  
**Bristols Mfg. Co.,** Waterbury, Conn.
- Steam Hammers, &c., Makers of.**  
**Dienelt & Eisenhardt,** Philadelphia.  
**Dudgeon, Richard,** 24 Columbia Street, N. Y.  
**Trethewey Mfg. Co.,** Pittsburg, Pa.
- Steam Heating.**  
**Webster Warren & Co.,** Camden, N. J.
- Steam Separators.**  
**Goubert Mfg. Co.,** 32 Cortland St. N. Y.  
**Harrison Safety Boiler Wks,** Phila. Pa.
- Steel Balls.**  
**Grant Anti-Friction Ball Co.,** Fitchburg, Mass.
- Steel Cold Rolled Strip.**  
**Wilmot & Hobbs Mfg. Co.,** Bridgeport, Conn.
- Steel Figures and Alphabets.**  
**Krogstad, W.,** 61 Fulton, N. Y.
- Steel Importers.**  
**Abbott, Wheelock & Co.,** N. Y. and Boston.  
**Hobson, Francis, Seaman & Co.,** 91 John St., N. Y.  
**Jessop, Wm. & Sons, Sheffield, Eng.** land, or 91 John, N. Y.  
**Milne, A. & Co.,** 1 Broadway, N. Y.  
**Newton & Shipman,** 33 John, N. Y.  
**Wetherell Bros.,** 93 Liberty St., N. Y.  
**Whitney, A. R. & Co.,** B'dway, N. Y.  
**Wolf, R. H. & Co., Ltd.,** 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).**  
**Jones, B. M. & Co.,** Boston.
- Steel Manufacturers.**  
**Etna-Standard Iron & Steel Co.,** Bridgeport, O.  
**Bethlehem Iron Co.,** S. Bethlehem, Pa.  
**Baker, Herman & Co.,** 103 Duane St. Carbon Steel Co., Pittsburg, Pa.  
**Chester Steel Castings Co.,** Phila., Pa.  
**Chrome Steel Works,** Brooklyn, N. Y.  
**Creuscent Steel Co.,** Pittsburg, Pa.  
**Elken & Co.,** Hagen, Germany.  
**Frankford Steel Co.,** Philadelphia.  
**Gautier Steel Department of Cambria Iron Co.,** Johnstown, Pa.  
**Hobson, Francis, Seaman & Co.,** 91 John St., N. Y.  
**Illinois Steel Co.,** Chicago, Ill.  
**Jessop, Wm. & Sons, Sheffield, Eng.** land, or 91 John, N. Y.  
**Kayser, Ellison & Co.,** Sheffield, Eng.  
**La Belle Steel Co.,** Pittsburg, Pa.  
**Lukens Iron & Steel Co.,** Coatesville, Pa.  
**Moorehead-McCleane Co.,** Pittsburg, Pa.  
**Moss, F. W.,** 83 John, N. Y.  
**Naylor & Co.,** 45 Wall, N. Y.  
**Pottsville Iron and Steel Co.,** Pottsville, Pa.  
**Reilly, J. W.,** Fort Hunter P. O., Pa.  
**Rowland, Wm. & Harvey,** Frankford, Philadelphia.  
**Singer, Nimick & Co.,** Pittsburg, Pa.  
**Stanley Works,** New Britain, Conn.  
**Steel & Iron Improvement Co.,** Pittsburgh, Pa.  
**Taylor Iron & Steel Co.,** High Bridge, N. J.  
**Wordlaw, S. & C.,** Sheffield, Eng.  
**Wetherell Bros.,** 93 Liberty, N. Y.  
**Wilmot & Hobbs Mfg. Co.,** Bridgeport, Conn.
- Steel, Manufacturers' Agents.**  
**Barnes, C. K. & Co.,** Philadelphia, Pa.  
**Cornling, Edw. & Co.,** 29 B'way, N. Y.  
**Lindsay, Jas. G. & Co.,** Phila., Pa.  
**Pierson & Co.,** 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**  
**Bethlehem Iron Co.,** S. Bethlehem, Pa.  
**Cambria Iron Co.,** Johnstown, Pa.  
**Illinois Steel Co.,** Chicago, Ill.  
**Montour Iron & Steel Co.,** Danville, Pa.  
**Riverside Iron Wks.,** Wheeling, W. Va.
- Steel, Tools.**  
**Frankford Steel Co.,** Philadelphia, Pa.  
**Jessop, Wm. & Sons, Sheffield, Eng.** land, or 91 John, N. Y.  
**Jones, B. M. & Co.,** Boston, Mass.  
**La Belle Steel Co.,** Pittsburg, Pa.
- Step Ladders.**  
**Bicycle Step Ladder Co.,** Chicago, Ill.  
**Croissant, M.,** Albany, N. Y.
- Stocks and Dies.**  
**Armstrong Mfg. Co.,** Bridgeport, Conn.  
**Billings & Spencer Co.,** Hartford, Conn.  
**Butterfield & Co.,** Derby Line, Vt.  
**Hart Mfg. Co.,** Cleveland, O.  
**Saunders' Sons, D.,** Yonkers, N. Y.  
**Wells Bros. & Co.,** Greenfield, Mass.  
**Wiley & Russell Mfg. Co.,** Greenfield, Mass.
- Storage.**  
**Security Warehouse, E. St. Louis, Ill.**
- Stove Linings.**  
**Ostrander Fire Brick Co.,** Troy, N. Y.
- Stove Pipe Thimbles.**  
**Cheney, S. & Son Manlius, N. Y.**
- Stove Trimmings.**  
**Troy Nickel Works, Troy, N. Y.**
- Street Lamps.**  
**Dietz, R. E. & Co.,** 60 Laight St., N. Y.  
**Steam Gauge & Lantern Co.,** Syracuse, N. Y.
- Strops.**  
**Electric Outlery Co.,** 113 Chambers, N. Y.  
**J. R. Torrey & Co.,** Worcester, Mass.
- Strapping Machines.**  
**Schmitz, E. Lothar,** 92 Reade St., N. Y.
- Structural Iron Work.**  
**Berlin Iron Bridge Co.,** East Berlin, Conn.  
**Boston Bridge Wks.,** Boston, Mass.  
**Lindsay, Jas. G. & Co.,** Phila., Pa.  
**Wrought Iron Bridge Co.,** Canton, O.
- Sulphuric Acid.**  
**Mathlessen & Hegeler Zinc Co.,** La Salle, Ill.
- Tacks, Brads, Staples, &c.**  
**Atlas Tack Corporation,** Boston, Mass.  
**Cobb & Drew,** Plymouth, Mass.  
**Grand Crossing Tack Co.,** Grand Crossing, Ill.  
**Nat. Screw & Tack Co.,** Cleveland O.  
**Phillips, E. & Sons,** South Hanover, Plymouth Mills, Plymouth, Mass.  
**Trufant, W. E.,** Whitman, Mass.
- Taps and Dies.**  
**Fletcherfield & Co.,** Derby Line, Vt.  
**Carpenter, J. M.,** Tap & Die Co., Pawtucket, R. I.  
**Manning, Maxwell & Moore,** 111 Liberty St., N. Y.  
**Wells Bros. & Co.,** Greenfield, Mass.  
**Wiley & Russell Mfg. Co.,** Greenfield, Mass.
- Testing Laboratories.**  
**Riehle Bros. Testing Mch. Co.,** Philadelphia.
- Testing Machines.**  
**Riehle Bros. Testing Mch. Co.,** Phila.
- Theatrical Hardware.**  
**Wollensak, J. F.,** Chicago, Ill.
- Thill Springs.**  
**Frost Thill Spring Co.,** Boston, Mass.  
**Sabin Machine Co.,** Montpelier, Vt.
- Time Record.**  
**Scattergood, H. W.,** Phila., Pa.
- Tinners' Hardware.**  
**Serger Bros.,** Philadelphia, Pa.
- Tinning Process.**  
**Sands, Thomas,** Nashua, N. H.
- Tin Plate Machinery.**  
**Lloyd Booth Co.,** Youngtown, Ohio.
- Tinware.**  
**Am. Stamping Co.,** 104 & 106 John St., N. Y.
- Tire Upsetters.**  
**Butts & Ordway,** Boston, Mass.
- Toe Calks, Steel.**  
**Burke, F. F.,** Boston, Mass.
- Tool Chests.**  
**Am. Tool Co.,** 200 W. Houston St., N. Y.
- Tools.**  
**Brown, R. H. & Co.,** New Haven, Conn.  
**Frassie Co.,** 19 Warren St., New York.  
**Mayhew, H. H. Co.,** Shelburne Falls, Mass.  
**Millers Falls Co.,** 93 Reade, N. Y.  
**Richardson, C. F. & Son,** Athol, Mass.  
**Standard Tool Co.,** Athol, Mass.  
**Stanley Rule & Level Co.,** 29 Chambers, Starrett, L. S., Athol, Mass.  
**Tower & Lyon,** 95 Chambers St., N. Y.
- Tools, Blacksmith and Wheelwrights.**  
**Buffalo Forge Co.,** Buffalo, N. Y.  
**Butts & Ordway,** Boston, Mass.  
**Champion Blower & Forge Co.,** Lancaster, Pa.  
**Plumb, Fayette R.,** Philadelphia, Pa.  
**Wiley & Russell Mfg. Co.,** Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**  
**Saunders' Sons, D.,** Yonkers, N. Y.
- Torches, Oil and Gasolene.**  
**Danzler Stove & Mfg. Co.,** Cleveland, O.  
**Schneider & Trenkamp Co.,** Cleveland, Ohio.
- Transom Lifters.**  
**Wollensak, J. F. Chicago, Ill.**
- Tree Protectors.**  
**McCallin Fence & Wire Wks.,** Columbus, Ohio.
- Trucks, Manufacturers of.**  
**Berger Bros.,** Philadelphia, Pa.  
**Boston & Lockport Block Co.,** Boston, Mass., and Lockport, N. Y.  
**Clark, G. P.,** Windsor Locks, Conn.  
**Lansing Wheelbarrow Co.,** Lansing, Mich.
- Tubes, Seamless Drawn Copper.**  
**Ansonia Brass & Copper Co.,** 19 and 21 Cliff, N. Y.  
**Randolph & Clowes,** Waterbury, Conn.
- Tubes, Steel.**  
**Leug's John S. Son & Co.,** 4 Fletcher St., New York.  
**Mannesmann Tube Co. Ltd.,** Landore, England.  
**Shelby Steel Tube Co.,** Shelby, O.
- Tumbling Barrels.**  
**Henderson Bros.,** Waterbury, Conn.
- Turnbuckles.**  
**Cleveland City Forge & Iron Co.,** Cleveland, O.  
**Merrill Bros.,** Brooklyn, E. D.
- Twist Drills, Makers of.**  
**Cleveland Twist Drill Co.,** Cleveland, O.  
**Morse Twist Drill & Machine Co.,** New Bedford, Mass.  
**New Process Twist Drill Co.,** Taunton, Mass.  
**Standard Tool Co.,** Cleveland.
- Valves, Gas, Water and Steam.**  
**Best, Fox & Co.,** Pittsburg, Pa.  
**Chapman Valve Mfg. Co.,** Boston.  
**Eynon-Evans Mfg. Co.,** Philadelphia, Pa.  
**Jenkins Bros.,** 71 John, N. Y.  
**McNab & Harlin Mfg. Co.,** 66 John N. Y.  
**Steam Regulator Co.,** Boston, Mass.
- Ventilating Fans.**  
**Huvett & Smith Mfg. Co.,** Detroit, Mich.
- Ventilator Appliances.**  
**Howard & Morse,** 45 Fulton, N. Y.
- Vise Jaws.**  
**Newark Mch. Tool Co.,** Newark, N. J.
- Vices.**  
**Capital Mch. Tool Co.,** Auburn, N. Y.  
**Hollands Mfg. Co.,** Erie, Pa.  
**Howard Iron Works,** Buffalo, N. Y.  
**Millers Falls Co.,** 93 Reade St., N. Y.  
**Prentiss Vise Co.,** 44 Barclay N. Y.  
**Tower & Lyon,** 95 Chambers St., N. Y.  
**Van Wagoner & Williams Co.,** 14 Warren St., N. Y.
- Wagon Jacks.**  
**Boston & Lockport Block Co.,** Boston, Mass., and Lockport, N. Y.  
**Covert's Saddlery Works,** Farmer, N. Y.
- Washers.**  
**Ballou, Wm. H. Co.,** Pawtucket, R. I.  
**Milton Mfg. Co.,** Milton, Pa.  
**Sternbergh, J. H. & Son,** Reading, Pa.
- Washing Machines.**  
**Neff, W. H.,** Cowan Ind.  
**Stearns Mfg. Co.,** Connersville, Ind.  
**Wayne, A. Mfg. Co.,** Ft. Wayne, Ind.
- Water Meters.**  
**Workington, Henry R.,** 86 & 88 Liberty St., N. Y.
- Water Wheels.**  
**P. Ole, Robt. & Son Co.,** Baltimore, Md.
- Wheelbarrows.**  
**Akron Tool Co.,** Akron, O.  
**Amer Steel Scraper Co.,** Sidney, Ohio.  
**Cochburn Barrow & Mch. Co.,** Jersey City, N. J.  
**Kilbourne & Jacob Mfg. Co.,** Columbus, Ohio.
- Lansing Wheelbarrow Co.,** Lansing, Mich.  
**Sidney Steel Scraper Co.,** Sidney, O.  
**Sweatt Mfg. Co.,** Minneapolis, Minn.  
**Toledo Wheelbarrow Works,** Toledo, O.
- Whips.**  
**American Whip Co.,** Westfield, Mass.
- Window Cord, Makers of.**  
**Samson Cordage Works,** Boston, Mass.
- Wire, Manufacturers of.**  
**Amer. Spiral Spring Co.,** Pittsburg, Pa.  
**Consolidated Steel & Wire Co.,** St. Louis, Mo.  
**Gautier Steel Department of Cambria Iron Co.,** Johnstown, Pa.  
**Miller & Van Winkle,** Brooklyn, N. Y.  
**New Castle Wire Nail Co.,** New Castle, Pa.  
**New Haven Wire Mfg. Co.,** New Haven, Conn.  
**Prentiss, Geo. W. & Co.,** Holyoke, Mass.  
**Salem Wire Mfg. Co.,** Salem, O.  
**Trenton Iron Co.,** Trenton, N. J.  
**Washburn & Moen Mfg. Co.,** Worcester, Vt.  
**Wetherell Bros.,** 93 Liberty St., N. Y.  
**Wolf, R. H. & Co., Ltd.,** 118th St. and Harlem River, N. Y.  
**Wright & Colton Wire Cloth Co.,** Worcester, Mass.
- Wire Cloth.**  
**Barnum, E. T.,** Detroit, Mich.  
**Clinton Wire Cloth Co.,** Clinton, Mass.  
**Darby, Edward & Sons,** Philadelphia.  
**Estey, W. S.,** 65 Fulton, N. Y.  
**Gilbert & Bennett Mfg. Co.,** 42 Cliff.  
**Howard & Morse,** 45 Fulton, N. Y.  
**N. J. Wire Cloth Co.,** Trenton, N. J.  
**Reliance Wire & Iron Wks.,** Milwaukee, Wis.  
**Scheeler & Sons,** Buffalo, N. Y.  
**Wickwire Bros.,** Cortland, N. Y.  
**Wright & Colton Wire Cloth Co.,** Worcester, Mass.  
**W. S. Tyler Wire Works Co.,** Cleveland.
- Wire Cutters.**  
**Cronk Hanger Co.,** Elmira, N. Y.  
**King, J. M. & Co.,** Watertown, N. Y.
- Wire Dies.**  
**McFarland, Wm.,** Trenton, N. J.  
**Newton & Shipman,** 33 John, N. Y.
- Wire Door Mats.**  
**Hartman Mfg. Co.,** Elwood City, Pa.  
**Horrocks, Joshua,** 45 Cliff St., N. Y.  
**The Wire Goods Co.,** Worcester, Mass.
- Wire Fences.—See Sencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**  
**Darby, Edward & Sons,** Phila.  
**Gilbert & Bennett Mfg. Co.,** 42 Cliff St., N. Y.  
**Ludlow-Saylor Wire Co.,** St. Louis.  
**Osawan Mills Co.,** Norwalk, Conn.  
**Scheeler & Sons,** Buffalo, N. Y.  
**Whitman & Barnes Mfg. Co.,** Syracuse, N. Y.  
**Wire Goods Co.,** Worcester, Mass.  
**Wickwire Bros.** Cortland, N. Y.  
**Williamson, C. T. Wire Novelty Co.,** Newark, N. J.
- Wire Machinery.**  
**Am. Tool Wks.,** Cleveland, O.  
**Manville, E. J. Mch. Co.,** Waterbury, Co.  
**Morgan Construction Co.,** Worcester, Mass.  
**Waterbury Mch. Co.,** Waterbury, Conn.
- Wire Straightening and Outting Machinery.**  
**Adt, John & Son,** New Haven, Conn.
- Wire Nails.**  
**Consolidated Steel & Wire Co.,** St. Louis, Mo.  
**Indiana Wire Fence Co.,** Crawfordsville, Ind.  
**Kilmer Mfg. Co.,** Newburg, N. Y.  
**New Castle Wire Nail Co.,** New Castle, Pa.  
**Phillips, E. & Sons,** South Hanover Mass.  
**Phillips, Townsend & Co.,** Phila., Pa.  
**Plymouth Mills,** Plymouth, Mass.  
**Salem Wire Nail Co.,** Salem, O.  
**Whitney, A. R. & Co.,** New York City
- Wire Rops, Steel.**  
**Consolidated Steel & Wire Co.,** St. Louis, Mo.  
**Illinois Steel Co.,** Chicago, Ill.  
**New Castle Wire Nail Co.,** New Castle, Pa.  
**Washburn & Moen Mfg. Co.,** Worcester, Mass.  
**Whitney, A. R. & Co.,** 17 B'way, N. Y.  
**Wolf, R. H. & Co., Ltd.,** 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel Makers.**  
**Broderick & Bascom Rope Co.,** St. Louis, Mo.  
**California Wire Works,** San Francisco.  
**Hazard Mfg. Co.,** Wilkesbarre, Pa.  
**A. Leuchen & Sons Rope Co.,** St. Louis.  
**Trenton Iron Co.,** Trenton, N. J.  
**Washburn & Moen Mfg. Co.,** Worcester, Mass.  
**Williamsport Wire Rope Co.,** Williamsport, Pa.
- Wood-Working Machinery.**  
**Seneca Falls Mfg. Co.,** Seneca Falls, N. Y.
- Wrenches, Manufacturers of.**  
**Bemis & Call Hardware & Tool Co.,** Springfield, Mass.  
**Billings, Spencer & Co.,** Hartford, Conn.  
**Capitol Mfg. Co.,** Chicago, Ill.  
**Central Iron & Steel Co.,** Brazil, Ind.  
**Coss Wrench Co.,** Worcester, Mass.  
**Gendron Iron Wheel Co.,** Toledo, O.  
**Keystone Mfg. Co.,** Buffalo, N. Y.  
**Portsmouth Wrench Co.,** Boston, Mass.  
**Tower & Lyon,** 95 Chambers St., N. Y.  
**Trumont Mfg. Co.,** Roxbury, Mass.  
**Williams, J. H.,** Brooklyn, N. Y.
- Wringers.**  
**Colby Wringer Co.,** Montpelier, Vt.

## ALPHABETICAL INDEX TO ADVERTISERS.

Abbott, Wheelock & Co.....	19	Buffalo Forge Co.....	110	Dangler Stove & Mfg. Co.....	69	Harrington, E. Son & Co.....	54
Acme Shear Co.....	77	Buffalo Scale Co.....	96	Darby, Edw. & Sons.....	8	Harrington & King Perforating Co....	11
Adt, John & Son.....	43	Buffalo Edge Tool Works.....	76	Davis & Cook.....	66	Harrington & Richardson Arms Co..	82
Ætna-Standard Iron & Steel Co.....	21	Buffalo Specialty Mfg. Co.....	69	Davis, I. B. & Son.....	40	Harrison Safety Boiler Wks.....	32
Aiken, Henry.....	31	Bullock Bellows Co.....	46	Davol, John & Sons.....	2	Hart, Henry C. Mfg. Co.....	83
Akron Tool Co.....	98	Burden Iron Co.....	94	Dayton Malleable Iron Co.....	110	Hart Mfg. Co.....	61
Alexander Bros.....	41	Burditt & Williams.....	84	Dean Bros. Steam Pump Works.....	39	Hartford Steam Boiler Insp. and Ins.	
Allentown Rolling Mills.....	31	Burgess & Loxley.....	110	Deitz, A. E.....	91	Co.....	34
Almond, T. R.....	45	Burgess Soldering Furnace Co.....	69	DeKalb Fence Co.....	9	Hartley & Graham.....	1
Am. Bolt Co.....	69	Burke, P. F.....	95	Deming Co.....	68	Hartman Mfg. Co.....	9
Am. Metal Co.....	4	Burnham, Geo. & Co.....	39	Detrick & Harvey Machine Co.....	55	Haskell, Wm. H. Co.....	102
Am. Pig Iron & Storage Warrant Co..	21	Burr & Houston Co.....	27	Detroit Dynamo Co.....	32	Hazard Mfg. Co.....	6
Am. Screw Co.....	14	Bussenius & Cunliffe.....	70	Detroit Foundry Equipment Co.....	29	Heinisch's R. Sons Co.....	77
Am. Spiral Spring Co.....	4	Burcher, W. & S.....	68	Diamond State Iron Co.....	94	Henderer, A. L.....	47
Am. Stamping Co.....	99	Butterfield & Co.....	51	Dienelt & Eisenhardt.....	47	Henderson Bros.....	31
Am. Steel Scraper Co.....	98	Butts & Ordway.....	40	Dietz, R. E. Co.....	85	Hendey Machine Co.....	64
Am. Tool Co.....	81	C. & C. Electric Motor Co.....	32	Disston, Henry & Sons.....	71	Hendricks Bros.....	2
Am. Well Works.....	55	California Wire Works.....	5	Dixon, Jos. Crucible Co.....	42	Hendrick Mfg. Co., Ltd.....	7
Am. Whip Co.....	109	Cambria Iron Co.....	20	Donaldson Iron Co.....	27	Hendryx, A. B. Co.....	3
Ames Sword Co.....	90	Cambridge Iron & Steel Co.....	25	Doscher, Martin.....	77	Henley Machine Tool Works.....	44
Ansonia Brass & Copper Co.....	2	Cambridge Roofing Co.....	16	Douglas, W. & B.....	68	Henley, M. C.....	84 & 100
Arcade File Works.....	73	Campfield, H. O.....	42	Draper Machine Tool Co.....	58	Henn, A. S. & Co.....	76
Arcade Malleable Iron Co.....	25	Capital Machine Tool Co.....	69	Dudgeon, Richard.....	48	Herbrand Co.....	24
Armstrong Mfg. Co.....	46	Capitol Mfg. Co.....	97	Duffy, J. A.....	60	Herrick & Cowell.....	49
Artificial Gas Engineering Co.....	30	Carbon Steel Co.....	21	Dunbar Bros.....	5	Herrick, J. A.....	30
Ashcroft Mfg. Co.....	36	Carlin's Sons, Thomas.....	59	Dunham Nut Machine Co.....	57	Hertz, T. & Son.....	4
Atlas Mfg. Co.....	85	Carpenter, J. M. Tap & Die Co.....	109	Durant, W. N.....	35	Hiles, C. A. & Co.....	70
Atlas Tack Corporation.....	12	Chadborne & Coldwell Mfg. Co.....	98	Dwight Slate Machine Co.....	46	Hillebrand & Wolf.....	49
Babcock & Wilcox Co.....	33	Chambers Bros. Co.....	102	Eagle Bicycle Mfg. Co.....	109	Hill, Clarke & Co.....	59
Baeder, Adamson & Co.....	66	Champion Blower & Forge Co.....	51	Eccles, Richard.....	92	Hobson, F. Seaman & Co.....	19
Banker & White.....	72	Champion Iron Co.....	9	Edge Moor Iron Co.....	28	Hoffman, C. & A.....	76
Bardsley, J.....	91	Champion Mfg. Co.....	101	Elken & Co.....	20	Hoffman, J. W. & Co.....	18
Barns, C. K. & Co.....	22	Chapman Mfg. Co.....	110	Electric Cutlery Co.....	78	Hogan, John L. & Co.....	18
Barnes, W. F. & John.....	45	Chapman Valve Mfg. Co.....	32	Emory, P. P. Mfg. Co.....	9	Hollands Mfg. Co.....	69
Barnett, G. & H.....	74	Chastillon, John & Sons.....	85	Empire Portable Forge Co.....	91	Holmes, Booth & Haydens.....	2
Barnum, E. T.....	9	Cheney, S. & Son.....	25	Enterprise Mfg. Co. of Pa.....	87	Holmes & Edwards Silver Co.....	79
Bass Foundry & Machine Works.....	35	Chess Bros.....	25	Erie Engine Works.....	33	Holt, Hiram & Co.....	101
Belden Machine Co.....	45	Chester Steel Casting Co.....	26	Estey, W. S.....	9	Horrocks, Joshua.....	12
Bell, Geo. E.....	51	Chrome Steel Works.....	24	Ette & Henger Mfg. Co.....	101	Hotchkiss, E. S.....	81
Bellevue Pump Co.....	39	Church, Isaac.....	102	Etting, Edw. J.....	18 & 29	Houston, C. B. & Co.....	18
Bement, Miles & Co.....	47	Church & Sleight.....	35	Eureka Cast Steel Co.....	110	Howard Iron Works.....	96
Bemis & Call Hardware & Tool Co..	96	Cincinnati Mfg. Co.....	86	Evans-Friction Cone Co.....	63	Howard & Morse.....	7
Berger Bros.....	96	Cincinnati Milling Mch. Co.....	63	Eynon-Evans Mfg. Co.....	34	Howson & Howson.....	6
Berlin Iron Bridge Co.....	10	Claffen Mfg. Co.....	42	F. & N. Mfg. Co.....	100	Hulbert Bros. & Co.....	109
Bertsch & Co.....	44	Clapp, Geo. M.....	59	Fairmount Machine Co.....	55	Hunt, Robert W. & Co.....	57
Best, Fox & Co.....	41	Clark, H. P.....	86	Fearing, Wm. S.....	2	Hurley Bros.....	45
Bethlehem Iron Co.....	22	Clark & Cowles.....	6	Ferdinand, L. W. & Co.....	83	Huyett & Smith Mfg Co.....	44
Bevin Bros. Mfg. Co.....	82	Clark Mfg. Co.....	74	Ferracute Machine Co.....	40	Ideal Mfg. Co.....	83
Bickford Drill & Tool Co.....	54	Cleveland Block Co.....	92	Field, Alfred & Co.....	76	Illinois Pure Aluminum Co.....	85
Bicycle Step Ladder Co.....	89	Cleveland City Forge & Iron Co.....	1	Fitch, W. & E. T.....	109	Illinois Steel Co.....	21
Bigelow, C. R.....	59	Cleveland Novelty Co.....	87	Fitchburg Machine Works.....	47	Indiana Bicycle Co.....	83
Biggall & Keeler Mfg. Co.....	43	Cleveland Rubber Works.....	79	Fitzsimons & Co.....	13	Indiana Wire Fence Co.....	4
Billings & Spencer Co.....	96	Cleveland Stamping & Tool Co.....	87	Flagg, Stanley G. & Co.....	110	Ingersoll Milling Machine Co.....	4
Billington, J. H. & Co.....	34	Cleveland Stone Co.....	57	Foley, J. W. & Co.....	53	Ives, H. B. & Co.....	4
Bingham, W. Co.....	83	Cleveland Twist Drill Co.....	52	Forehand Arms Co.....	81	Jacobus, W. H.....	4
Birmingham Iron Foundry.....	25	Clinton Wire Cloth Co.....	8	Fraim, E. T.....	90	Jarecki Mfg. Co.....	4
Bissell, E. Son & Co.....	61	Cobb & Drew.....	9	Frankford Steel Co.....	20	Jeffrey Mfg. Co.....	4
Blake & Johnson.....	13	Cockburn Barrow & Machine Co.....	97	Fraser Co.....	63	Jenkins Bros.....	4
Bliss Co., E. W.....	43	Coes, Loring & Co.....	97	Frost Thill Spring Co.....	92	Jenkins & Lingle.....	4
Boardman, L. & Son.....	83	Coes Wrench Co.....	97	Fulton Iron & Engine Works.....	54	Jenner, H. W. T.....	4
Bogert, John L.....	63	Coffin & Leighton.....	46	Fulton Steam Boiler Wks & Foundry	40	Jessop, Wm. & sons.....	4
Boker, Hermann & Co.....	19	Colburn, A. M.....	51	Gardner, Jas. & Son.....	26	Johns, H. W. Mfg. Co.....	4
Boone, W. C. Mfg. Co.....	27	Colby Wringer Co.....	89	Garrison, A., Foundry Co.....	25	Johnson Foundry Co.....	4
Booth, The Lloyd Co.....	28	Coldwell Lawn Mower Co.....	100	Gartland Foundry Co.....	28	Johnson, I. G. & Co.....	4
Borden & Lovell.....	13	Colliau, Victor.....	31	Garvin Machine Co.....	59	Johnson, I. H., Jr., & Co.....	4
Borgner, Cyrus.....	28	Conroy, P. J. & Co.....	92	Gautier Steel Department.....	16	Johnson, S. C.....	4
Boss Mfg. Co.....	99	Consolidated Steel & Wire Co.....	15	Gaylord, F. L. Co.....	3	Jones, B. M. & Co.....	4
Boston Bridge Works.....	16	Continental Iron Works.....	35	Gendron Iron Wheel Co.....	82	Jones, Jesse & Co.....	4
Boston Gear Works.....	38	Copeland & Bacon.....	54	Gilbert & Bennett Mfg. Co.....	8	Jones & Lamson Machine Co.....	4
Box, Alfred & Co.....	54	Corning, Edw. & Co.....	107	Glazier Stove Co.....	65	Kayser, Ellison & Co.....	4
Boycie Rivet Co.....	110	Correspondence School of Mechanics	109	Gleason Tool Works.....	38	Keeley, Jerome & Co.....	4
Bradley & Co.....	17	Cotton, Barclay W. & Co.....	17	Goodell Co.....	78	Kelly, Daniel.....	4
Bradley Fertilizer Co.....	41	Coulter & McKenzie Machine Co.....	56	Goubert Mfg. Co.....	40	Kennedy, Julian.....	4
Brass Goods Mfg. Co.....	2	Covert Mfg. Co.....	92	Gould & Eberhardt.....	42	Keuffel & Esser Co.....	4
Bridgeport Chain Co.....	79	Covert's Saddlery Works.....	65	Graham, John H. & Co.....	81	Keyless Lock Co.....	4
Bridgeport De-oxidized Bronze & Metal Co.....	2	Cox, Justice, Jr.....	22	Grand Crossing Tack Co.....	12	Keys, W. W. & Co.....	4
Bridgeport Gun Implement Co.....	52	Cramp, Wm. & Sons S. & E. B. Co.....	3	Grand Rapids Hand Screw Co.....	75	Keystone Clutch & Machine Works.....	4
Briggs, Marvin.....	59	Crescent Horse Shoe & Iron Co.....	94	Grant Anti-Friction Ball Co.....	46	Keystone Mfg. Co.....	4
Bristols' Mfg. Co.....	1	Crescent Phosphorized Metal Co.....	3	Grant Corundum Wheel Mfg. Co.....	56	Kilbourne & Jacobs Mfg. Co.....	4
Britton, J. Blodgett.....	30	Crescent Steel Co.....	21	Green, A. H.....	96	Kilmer Mfg. Co.....	4
Broderick & Bascom Rope Co.....	6	Cresson, Geo. V. Co.....	49	Gurney, F. B.....	77	King, J. M. & Co.....	4
Bronson Supply Co.....	85	Croissant, M.....	79	Gwinner Mfg. Co.....	70	Knap & Cowles Mfg. Co.....	4
Brown, E. E. & Co.....	91	Cronk Hanger Co.....	84	Haight & Clark.....	27	Koch, A. B. & Co.....	4
Brown Hoisting & Conveying Mch. Co.	41	Crosby, G. A. & Co.....	45	Haines & Zimmermann.....	82	Kohler, F. E. & Co.....	4
Brown, R. H. & Co.....	66	Crosby Steam Gage & Valve Co.....	3	Haines Gauge Co.....	28	Konigsow, Otto.....	4
Bryden Horse Shoe Co.....	94	Cruikshank, D. B.....	58	Halk & Naumann.....	3	Kreischer, B. & Sons.....	4
Buck Bros.....	77	Cumberland Nail & Iron Co.....	18	Hall & Ross Husking Glove Co.....	3	Krogsrud, W.....	4
Buckeye Churn Co.....	86	Cumley, J. & Bro.....	77	Hamilton Machine Tool Co.....	50	La Belle Steel Co.....	4
Buckeye Engine Co.....	35	Cushman Chuck Co.....	50	Hammer & Co.....	57	Lad & Rand Row 498 Co.....	4
Buckeye Mfg. Co.....	67 & 74	Dallett, Thos. H. & Co.....	52	Hanson & Vahl Whistle Co.....	52	Lane & Boddy.....	4
		Dame, Stoddard & Kendall.....	82	Hardware Board of Trade.....	81	Lane Brothers.....	4
						Lansing Wheelbarrow Co.....	4
						Lape, W. E.....	4
						Laughlin, Alex. & Son.....	4

Lay, Jos. & Co.	86	N. J. Wire Cloth Co.	8	Rieh1 Bros. Testing Machine Co.	43	Syracuse Specialty Mfg. Co.	90
Lea, J. Tatnall & Co.	23	New Process Twist Drill Co.	52	Ripley Mfg. Co.	90	Taintor Mfg. Co.	72
Lean, D. R. Co.	31	New Process Raw Hide Co.	47	Riverside Iron Works.	24	Tablet & Ticket Co.	57
Leavitt Machine Co.	84	Newton & Shipman.	19	Roberts, A. & P. & Co.	20	Talcott, W. O.	42
Le Count, C. W.	94	N. Y. Belting & Packing Co.	42	Roberts, Frank C. & Co.	28	Taylor Iron & Steel Co.	24
Leechburg Foundry & Machine Co.	21	N. Y. Machinery Depot.	58	Roberts Mfg.	41	Thomson, W. H. & Co.	18
Le Massena, C. E. & Co.	56	N. Y. Mallet & Handle Works.	70	Robinson, J. M. & Co.	43	Tiebout, W. & J.	91
Leng's, Jno. S. Son & Co.	110	N. Y. Powder Co.	25	Robinson-Rea Mfg. Co.	28	Titchener, E. H. & Co.	7
Leonard, B. E.	97	Niagara Stamping & Tool Co.	55	Rogers, The Wm. Mfg. Co.	79	Tod, Wm. & Co.	35
Leonard, J.	22	Nicholson File Co.	72	Rollason Gas Engines.	36	Toledo Bicycle Co.	83
Leonard T. F.	97	Nicolls, Wheeler & Co.	17	Rogers & Hamilton Co.	75	Toledo Block Works.	92
Leschen, A. & Sons Rope Co.	6	Niles Tool Works.	59	Rouse, Duryea Cycle Co.	65	Toledo Wheelbarrow Works.	90
Levis, Henry & Co.	22	North Bros. Mfg. Co.	18	Rowland, Wm. & Harvey.	110	Toomey, Frank.	50
Lidgerwood Mfg. Co.	110	North Bros. Mfg. Co.	65	Russell, Burdsall & Ward.	110	Torrey, J. R. Razor Co.	77
Lindsay, Jas. G. & Co.	18	Northampton Cutlery Co.	78	Russia Cement Co.	67	Totten & Hogg Iron and Steel Fdry.	25
Link-Belt Engineering Co.	45	Northampton Emery Wheel Co.	56	St. Louis Bronze & Aluminum Works	2	Tower & Lyon.	80
Lockhart Iron & Steel Co.	23	Norton Emery Wheel Co.	56	Sabin Machine Co.	4	Townsend, W. P. & Co.	102
Lodge & Shipley Machine Tool Co.	57	Norton & Jones Machine Tool Works.	41	Salem Foundry & Machine Shop.	54	Trenton Iron Co.	4
Lovell, Jno. P. Arms Co.	83	Norwalk Iron Works Co.	39	Salem Wire Nail Co.	13	Trenton Malleable Iron Co.	27
Long & Allstatter Co.	40	Nourse, Fred Co.	5	Samson Cordage Works.	1	Threshewey Mfg. Co.	30
Lovell Mfg. Co., Ltd.	60	Nubian Iron Enamel Co.	53	Samuel, Frank.	17	Trimont Mfg. Co.	96
Lovell, Tracy & Co.	95	Obermayer, S. Co.	29	Sands, Thomas.	63	Troy Nickel Works.	77
Lovegrove & Co.	50	Ogden & Wallace.	22	Sargent Co.	28	Tuck Mfg. Co.	5
Lucas, C. O. & Co.	40	Ohio Lantern Co.	84	Saunders's Sons, D.	48	Tudor Iron Works.	1
Ludlow-Saylor Wire Co.	7	Old Dominion Iron & Nail Works Co.	95	Scattergood, H. W.	57	Tyler Wire Works Co. W. S.	64
Lufkin Rule Co.	75	Osborn, G. Edw. & Co.	35	Schaeffer & Co.	99	Underhill, Clinch & Co.	76
Lukens Iron & Steel Co.	17	Ossawan Mills Co.	65	Scheeler & Sons.	6	Union Hardware Co.	80
Lundberg, Gustaf.	19	Ostrander Fire Brick Co.	26	Schmitz, E. Lothar.	76	Union Mfg. Co.	50
McCabe, J. J.	58	Ostrander, W. R. & Co.	36	Schneider & Trenkamp Co.	69	Union Metallic Cartridge Co.	1
McCaffrey File Co.	72	Otto Gas Engine Works.	36	Schwarzenberg Bros. & Co.	63	Valentine, M. D. & Bro.	28
McCallip Fence & Wire Works.	9	Oxford Iron & Nail Co.	13	Scott, Geo. M.	53	Valley Pump Works.	39
McClure, Amaler & Co.	30	Packer, C. W.	65	Scoville Mfg. Co.	2	Van Dorn Iron Works Co.	9
McCoy, Jos. F. & Co.	86	Palmer & De Mooy.	26	Scranton Forging Co.	94	Vanderbilt Sash Balance Co.	90
McFarland, Wm.	4	Palmer Hardware Mfg. Co.	66	Scranton Supply & Machine Co.	58	Van Wagoner & Williams Co.	110
McGowan, J. H. & Co.	39	Pancoast Henry, B. & Co.	49	Seaman, Sleeth & Black.	25	Victor Mfg. Co.	91
McIlvain, Wm. & Sons	27	Passaic Rolling Mill Co.	22	Security Warehouse.	7	Vulcan Iron Works.	25
McKay, J. S. & Co.	18	Paxson, J. W. & Co.	29	Sellers, Wm. & Co.	55	Waddell, Wooden Ware Works.	88
McKinney Mfg. Co.	80	Peabody & Parks.	70	Seneca Falls Mfg. Co.	54	Wallace Wm. H. & Co.	22
McLean, John.	35	Peck, A. G. & Co.	110	Sessions Foundry Co.	26	Wardlow, S. & C.	19
McLeod & Henry Co.	26	Peerless Foundry Co.	26	Seyfert's Sons, L. F.	58	Warren Axe & Tool Works.	75
McNab & Harlin Mfg. Co.	35	Penna. Diamond Drill & Mfg. Co.	38	Shelby Steel Tube Co.	31	Washburn & Moen Mfg. Co.	4
Machinists' Supply Co.	58	Pennsylvania Mch. Co.	58	Shepard, Sidney & Co.	68	Washburn Shops.	51
Mahoning Foundry & Machine Shop	24	Perry, W. H. & Co.	60	Sherwood Mfg. Co.	41	Waterbury Brass Co.	2
Mahoning Valley Iron Co.	22	Philadelphia Drop Forge Co.	27	Shilling Foundry Co.	31	Waterbury Farrel Foundry & Ma-	39
Main Belting Co.	42	Philadelphia Engineering Wks.	31	Shipman Engine Co.	36	chine Co.	39
Mannesmann Tube Co.	24	Phillips, E. & Sons.	13	Shoenberger & Co.	93	Waterbury Machine Co.	48
Mann, Edwin R. & Co.	18	Phillips, Townsend & Co.	6	Sibell, Geo. H. & Co.	19	Watson & Stillman.	49
Manning, Maxwell & Moore	52	Phoenix Horseshoe Co.	95	Sickels, Sweet & Lyon.	82	Wayne, Anthony Mfg. Co.	86
Manville Machine Co., E. J.	57	Phoenix Iron Co.	17	Sidney Steel Scraper Co.	99	Webster, Warren & Co.	38
Man field, H. H.	59	Phoenix Iron Works Co.	36	Sigourney Tool Co.	46	Welland, Chas.	30
Maris & Beekley.	55	Phosphor Bronze Smelting Co.	3	"Silver Finish"	5	Wellman Iron & Steel Co.	17
Maslin, J. & Son	39	Pickands, Brown & Co.	21	Silver Mfg. Co.	95	Wells Bros. & Co.	51
Mason Regulator Co.	109	Pierion & Co.	21	Simonds Mfg. Co.	70	West Cocksack Iron Fdy.	27
Mast, Poos & Co.	69	Pike Mfg. Co.	56	Singer, Nimick & Co.	92	Western Wheel Works.	83
Matthiessen & Hecker Zinc Co.	2	Pilling & Crane.	18	Skelly, J. W. & Son.	92	Wetherell Bros. & Co.	19
Maurer, H. & Son	26	Pittsburgh I. & S. Eng. Co.	31	Skinner Chuck Co.	50	Wetherhill, Robt. & Co.	109
Mayhew, H. H. Co.	76	Pittsburgh Mfg. Co.	47	Smith & Egge Mfg. Co.	50	White, A. A. & Co.	91
Merrill Bros.	18	Pittsburgh Reduction Co.	44	Smith, H. D. & Co.	95	White, L. & I. J. Co.	77
Merrill Mfg. Co.	48	Place, Geo.	87	Smith, J. D. Foundry Supply Co.	26	White Mt. Freezer Co.	65
Merriman, A. H.	48	Plumb, Fayette R.	78	Smith Friction Drill and Tool Co.	50	Whitlock Coil Pipe Co.	34
Meyers, F. J. Mfg. Co.	13	Plume & Atwood Mfg. Co.	2	Smith, Oliver A.	97	Whitman & Barnes Mfg. Co.	72
Miles, F. S.	39	Plymouth Mills.	15	Smythe, S. R. Co., Inc.	30	Whitney, A. R. & Co.	24
Miller & Van Winkle.	4	Poole, Robt. & Son Co.	38	Sommer's Son, John.	110	Whitney, A. & Sons.	22
Miller Lock Co.	90	Pope Mfg. Co.	65	Southwark Foundry & Machine Co.	36	Whitton, D. E. Mch. Co.	50
Millers Falls Co.	110	Popping, J.	63	Spedel, J. G.	55	Wickwire Bros.	7
Milne, A. & Co.	20	Port Chester Bolt & Nut Co.	40	Speirs, J. C. & Co.	25	Wilcox & Howe Co.	92
Milton Mfg. Co.	101	Porter, H. K.	46	Spencer's I. S. Sons.	27	Wiley & Russell Mfg. Co.	49
Miner & Peck Mfg. Co.	46	Portsmouth Wrench Co.	96	Springfield Brass Co.	39	Williams, J. H. & Co.	96
Mohr, J. J.	12	Pottstown Iron Co.	20	Springfield Emery Wheel Co.	56	Williamson, C. T. Wire Nov. Co.	109
Mohr, S. G.	92	Pottsville Iron & Steel Co.	17	Standard Fdry. & Mfg. Co.	27	Williamsport Wire Rope Co.	6
Montour Iron & Steel Co.	22	Powell Planer Co.	47	Standard Horse Shoe Co.	94	Willmot & Hobbs Mfg. Co.	1
Moore, Dr. Gideon E.	64	Pratt & Whitney Co.	51	Standard Steel Casting Co.	110	Wilson, E. H. & Co.	18
Moore Mfg. & Foundry Co.	54	Prentiss, Geo. W. & Co.	6	Standard Tool Co.	52	Wilson, John.	76
Moore & White Co.	35	Prentiss Tool & Supply Co.	58	Standard Tool Co.	67	Wilson, J. Fred.	102
Moore & Wickert.	100	Prentiss Vise Co.	69	Stanley Rule & Level Co.	109	Wilson, W. A.	47
Moorhead-McCleane Co.	23	Pullman, J. Wesley.	36	Stark Mch. & Tool Co.	45	Winslow, Sm'l, Skate Mfg. Co.	82
Morgan Construction Co.	4	Pullman Sash Balance Co.	91	Starrett, L. S.	75	Wire Goods Co.	6
Morgan Spring Co.	4	Queen Anne Screen Co.	87	Steam Gauge & Lantern Co.	85	Wister, Francis.	27
Morrison, Robert.	36	Quint, A. D.	53	Stearns, E. C. & Co.	64	Wister, L. & R. & Co.	22
Morse Twist Drill & Machine Co.	52	Rainey, W. J.	1	Stearns Mfg. Co.	86	Witherow, Jas. P. Co.	30
Morse, Williams & Co.	55	Rand Drill Co.	38	Steel & Iron Improvement Co.	64	Wolcott & West.	63
Morton, Thos.	89	Randolph & Clowes.	1	Steptoe, J. & Co.	80	Wolff, R. H. & Co. Ltd.	5
Moseley Iron Bridge & Roof Co.	9	Read, Wm. & Sons.	109	Sterling Emery Wheel Co.	56	Wollensak, J. F.	72, 79
Mount Carmel Bolt Co.	109	Reading Hardway Co.	91	Sternbergh, J. H. & Son.	102	Wood Alan & Co.	18
Myers, F. E. & Bro.	68	Reece, Edw. F.	51	Stevens Arms & Tool Co.	81	Wood, R. D. & Co.	27
National Horse Nail Co.	95	Reeves, Paul S.	110	Stiles & Parker Press Co.	43	Wood, W. Dewees Co.	23
National Machinery Co.	44	Reeves Pulley Co.	64	Stocking, E. B.	6	Woodward & Rogers.	68
National Pipe-Bending Co.	34	Relly, J. W.	18	Storck Mfg. Co.	92	Wooster, F. V.	90
National Saw Co.	70	Reliance Wire Wks Co.	8	Stover Mfg. Co.	92	Worcester Mch. Screw Co.	102
National Screw & Tag Co.	12	Reynolds & Co.	13	Stow Flexible Shaft Co.	52	Worthington, Henry R.	39
Naylor & Co.	22	R. T. Perkins Horse Shoe Co.	94	Stow Mfg. Co.	52	Wright & Colton Wire Cloth Co.	8
Neff, W. H.	92	Rice, C. F.	61	Stuart & Peterson Co.	87	Wright, Peter & Son.	70
Newark Machine Tool Works	110	Richards, D. W. & Co.	60	Sturtevant, B. F. Co.	47	Wrought Iron Bridge Co.	15
New Britain Hardware Mfg. Co.	104	Richardson, C. F. & Son.	74	Supplee Hardware Co.	100	Wurster, F. W. & Co.	110
New Castle Wire Nail Co.	96	Ridgway, Craig & Son.	53	Sweetser, W. A.	93	Wyman & Gordon.	27
New Haven Copper Co.	97			Swindell, W. & Bros.	30	Yale & Towne Mfg. Co.	54
New Haven Mfg. Co.	97					Zucker & Levett Chem. Co.	32
New Haven Wire Mfg. Co.	97						

# Hopkins & Allen Mfg. Co.'s SINGLE BARREL SHOT GUN

12, 16 AND 20 GAUGE.

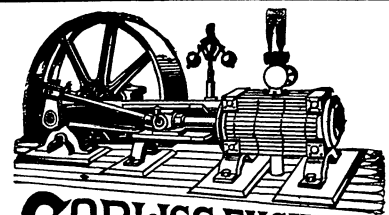
Perfect workmanship. Thoroughly guaranteed. A popular gun at a popular price.

Packed in pasteboard boxes for hardware trade. Comes apart without the aid of tools.

Send for Circular and New Prices.

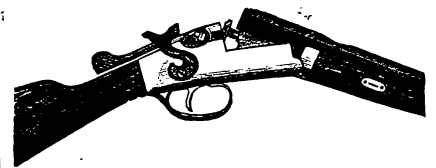
**HULBERT BROS. & CO.,**

26 WEST 23d ST., NEW YORK.



**CORLISS ENGINES**  
**MACHINISTS**  
IRON FOUNDERS, BOILER MAKERS.  
**ROBT. WETHERILL & CO.**  
CHESTER, PA.

## GUNS



AGENTS FOR THE

**Forehand & Wadsworth**  
**SINGLE - GUN**  
**TOP SNAP ACTION.**

Best Gun made. Sold very largely by the Hardware Trade.

Special prices to the trade. Also all grades Double Guns.

**WM. READ & SONS,**  
107 WASHINGTON ST., BOSTON, Mass.  
ESTABLISHED 1826.

## AMERICAN WHIPS

If you sell whips send for price on 10 Americans, our special assortment for hardware dealers. A complete line in one lot.

**AMERICAN WHIP CO.,**  
WESTFIELD, MASS.

Thousands of Books on engineering are sold by us every year. Our series of five volumes is the best published.

**MASON REGULATOR CO.,**  
BOSTON, MASS.

**THE W. & E. T. FITCH CO.,**  
NEW HAVEN, CONN.  
Manufacturers of a variety of  
**HARNESSE SNAPS.**



This Cut represents the  
**UNION PAT. BOLT SNAP.**

**WHEN IN NEED** Address **MOUNT CARMEL BOLT CO.,**  
MOUNT CARMEL, CONN.



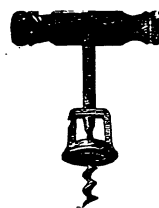

**DIRECTIONS FOR USING**  
**WILLIAMSON'S NEW POWER CORK SCREWS.**  
**KEEP ON TURNING, DO NOT PULL.**

No. 1243, Nickel Plated, Apple Wood Handle, \$5.00 per dozen.  
1443, Rosewood 5.50

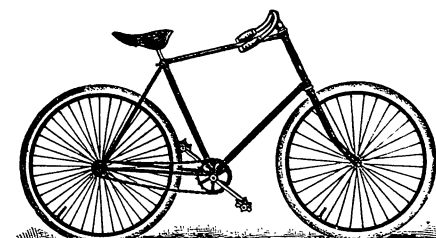
For Discounts and Prices of other styles send for Catalogue.

**C. T. WILLIAMSON WIRE NOVELTY CO., NEWARK, N. J.**

Manufacturers of Wire Specialties for the Trade.



## PRICE ISSUES OF 1894 WILL BE MET.

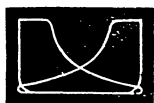


**EAGLE ALUMINUM RIMS** (Patented)  
A 24 lb. Guaranteed Road Wheel.  
**Highest Grade. Correct Design.**

**Special ADVANCE Proposition**  
FOR THE  
**Hardware Trade**

Samples (only) '94 Lines Ready for Delivery.  
New Lines, New Features, New Patterns.

OUR SIXTH YEAR.  
**THE EAGLE BICYCLE MFG. CO.,**  
Makers of Highest Grade Bicycles. Torrington, Ct



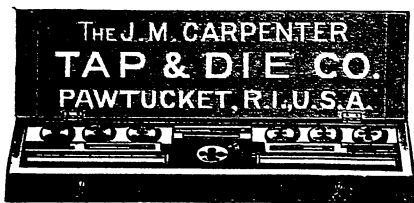
**MAKE YOURSELF A Mechanical Engineer or Draughtsman;** or qualify charge of, or to superintend the manufacture of machinery by devoting your idle hours to **Home Study** by the method of **THE CORRESPONDENCE SCHOOL OF MECHANICS**, Scranton, Pa. To begin, students need only know how to read and write. Moderate Charges. Send for **FREE Circular.**

**THE W. W. & R. M. KEYS CO.**  
BRIDGEPORT, CONN.

Bronze, Composition and Brass Castings,  
Ingots, Etc.

ALSO MANUFACTURERS OF

**BABBITT METALS.**

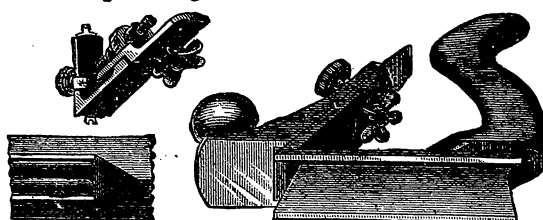


**The Iron Age Standard Hardware Lists**  
For use in Price Books. Compiled by R. R. WILLIAMS, Hardware editor of *The Iron Age*. Second edition revised. \$0.25  
For Sale by David Williams, 96-102 Reade St., N. Y.

**IMPROVED**  
**Labor-Saving**  
**CARPENTERS'**  
**TOOLS.**  
**STANLEY**  
**RULE & LEVEL CO.**  
**New Britain, Conn.**

SOLD BY ALL  
**Hardware Dealers.**

**Stanley's Adjustable Chamfer Plane.**



This Plane will do perfect chamfer or stop chamfer work. For Beading, Reeding or Moulding a chamfer, an additional section is furnished (price \$1.00) with six cutters, sharpened at both ends, including a large variety of ornamental forms.  
No. 72. Chamfer Plane, 9 inches in length, 1 1/2 inch Cutter. \$3 00  
No. 72 1/2. Chamfer Plane, with Beading Attachment. 3 00

# PAUL S. REEVES,

## Philadelphia.

# Phosphor Bronze

AND

## BABBITT METALS.

Lead Lined Car Bearings a Specialty.

Brass and Phosphor Bronze Castings from  $\frac{1}{4}$  pound to 20,000 pounds in weight.

**STANDARD STEEL CASTING CO.**  
THURLOW, PA.  
**STEEL CASTINGS**  
QUALITY EQUAL TO STEEL FORGINGS

ESTABLISHED  
Spring Making, 1842. Steel Making, 1845.  
Norway Iron, 1871 (Re-Rolled).

**WM. & HARVEY ROWLAND,**  
MANUFACTURERS OF

Springs, Steel, Re-Rolled Norway  
Iron & Slit Norway Nail Rods.

Address FRANKFORD P. O., PHILADELPHIA

**BURGESS & LOXLEY,**

Malleable Iron and Small Steel Castings.

MILITARY ROAD & CHANDLER STREET,  
BUFFALO, N. Y.

**DAYTON**  
MALLEABLE  
IRON CO.  
**DAYTON, O.**  
HIGH CLASS  
CASTINGS A SPECIALTY.

**NORWAY IRON RIVETS.**

FOR ALL PURPOSES.

WRITE FOR PRICES  
TO

**THE BOYCE RIVET CO.**  
MUNCIE, INDIANA.

Spon's Tables and Memoranda for Engineers.  
11th edition (vest-pocket edition). 140 pages, flexible leather. \$0.40  
For Sale by David Williams, 96-102 Reade St., N. Y.

**BUFFALO**  
**BLOWERS**  
FOR CUPULAS, FORGES,  
FURNACES & CHAUSTERS  
STEAM FANS, HEATERS &  
VENTILATING WHEELS  
**BUFFALO FORGE CO.**  
BUFFALO, N. Y.

**STANLEY G. FLAGG & CO.,** Philadelphia, Pa.  
Office and Works, N. W. Cor. 19th St. & Pennsylvania Ave.  
Manufacturers of **STEEL CASTINGS**,  
A Substitute for Steel and Wrought Forgings.  
Circulars Sent on Application.

Butcher Saw Blades.

See Page 66.

**MILLERS FALLS CO.**

93 Reade St., New York.

**EUREKA CAST STEEL COMPANY.**  
Office and Works, Chester, Pa.  
Open Hearth, Crucible and Eureka Steel Castings.  
Railroad and Machine Castings.  
Locomotive Cross-Heads and Gearing a Specialty.  
Guaranteed Knuckles for M. C. B. Couplers.

**SPRINGS AND AXLES**  
ROLLING MILL  
**F. W. WURSTER & CO.**  
375 Kent Ave. Brooklyn N. Y.

New Full Mounted  
Lightning Screw  
Plate.  
Send for Catalogue.

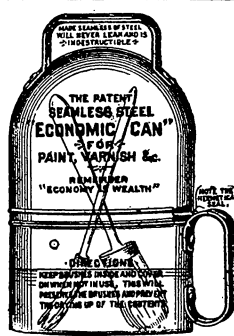


**WILEY & RUSSELL MFG. CO.,** - Greenfield, Mass.

**STEEL TUBES**  
WELDLESS  
JOHN S. LENG'S SON & CO., NEW YORK.

**LIDGERWOOD**  
**HOISTING ENGINES.**  
300 styles and sizes. Over 9500 in use.  
**LIDGERWOOD MFG. CO.,** 96 Liberty St., N. Y.

**JOHN SOMMER'S QUALITY**  
**IXL** CORK LINED FAUCETS,  
MADE OF SELECTED ROCK SUGAR MAPLE  
AND PURE LINSEED OIL.  
ONLY THE GENUINE  
ARE STAMPED  
IN THE WOOD  
WITH OUR TRADE MARK MULTI SE CROCS  
AS PERFECT AND IMPROVED  
**JOHN SOMMER'S SON, MFR.,** 8-12 PEARL ST., NEWARK N. J.



THE "ALWAYS READY"  
"ECONOMIC" CAN.  
For Paint, Varnish,  
Shellac, &c.  
The hermetical seal  
preserves the  
brushes and contents.  
No more Dry or Hard  
Brushes.  
No more Paint Skins  
and Drying up of  
Contents.  
This can commends  
itself at once to Painters,  
Pattern and Cabinet  
Makers, and all  
who use fine Paints,  
Varnish, Shellac, etc.

**THE WILMOT & HOBBS MFG. COMPANY,**  
20 Murray St., NEW YORK.

**RUSSELL, BURDSALL & WARD,**  
Portchester, N. Y.,  
Manufacturers of  
Carriage, Tire, Plow and Stove  
**BOLTS**

Carriage Bolts made from Best Square Iron a  
Specialty.

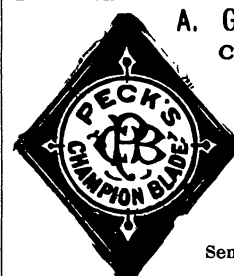
**Solid Steel Castings**  
From Crucible and Open Hearth.  
Steel and Gun Metal Rolls  
Specialties.  
Air Furnace Refined  
Malleable Castings.  
**ISAAC C. JOHNSON & CO.,**  
ESTABLISHED 1853,  
SPUYTEN DUYVIL, NEW YORK CITY.

**DOG COLLARS,  
DOG MUZZLES.**

THE  
**CHAPMAN**  
**MFG. CO.,**  
Meriden, Conn.



**A. G. PECK & CO.**  
Cohoes, N. Y.  
MANUFACTURERS OF



**AXES, ADZES  
BROAD AXES  
HATCHETS.**

Send for Catalogue and  
Price List.

**CASTINGS.**

Light Machine and  
small gray iron cast-  
ings of superior qual-  
ity. We have excep-  
tional facilities for pro-  
ducing fine work.

Prices reasonable.

**VAN WAGONER & WILLIAMS CO.**

Cleveland, Ohio.

Published by **DAVID WILLIAMS**, 96-102 Reade Street,  
New York. Printed by **THE WILLIAMS PRINTING**  
Co., General Book, Commercial and Newspaper  
Printers and Binders, Nos. 96-102 Reade St.,  
New York.



# THE IRON AGE

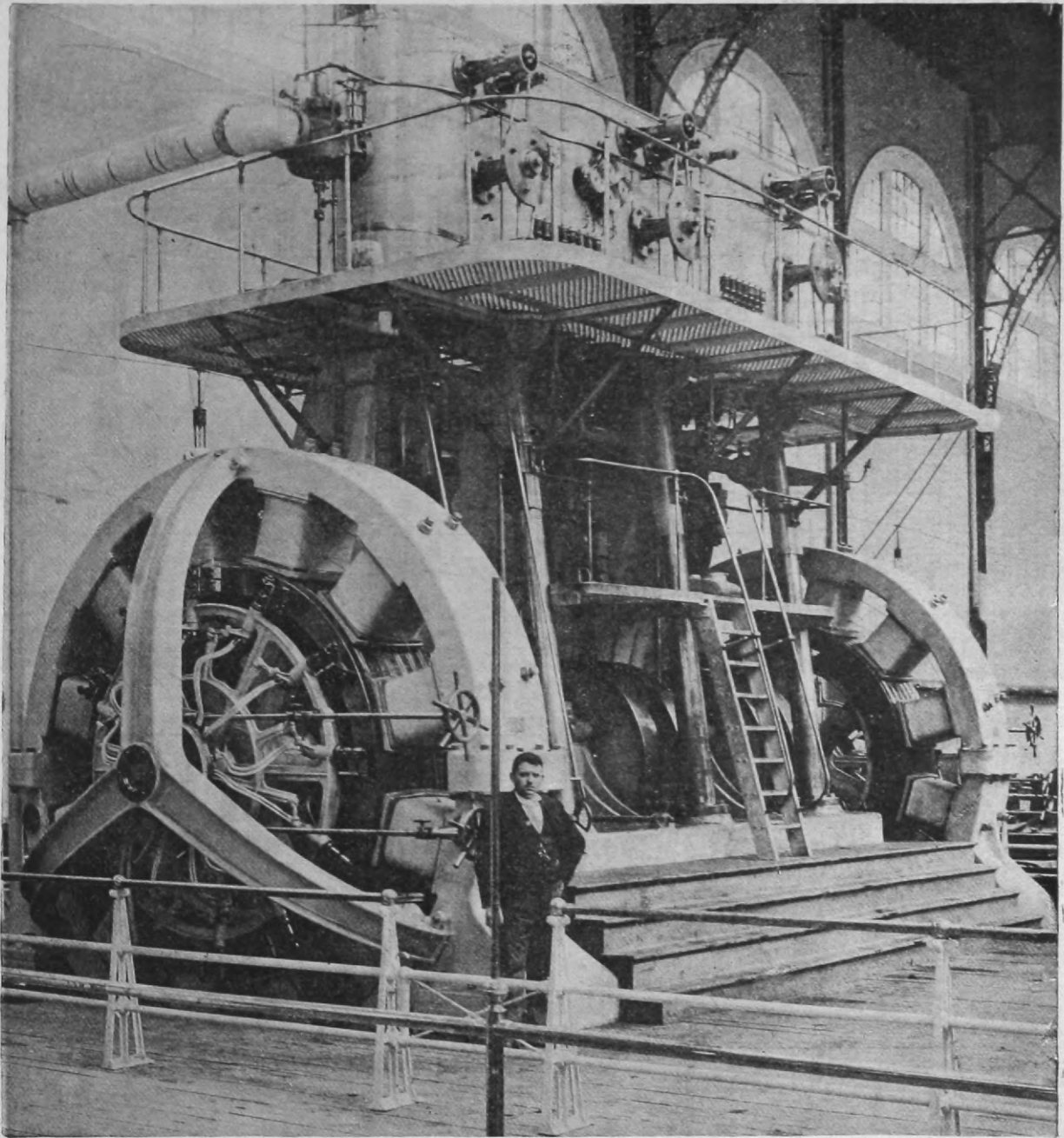
THURSDAY, SEPTEMBER 21, 1893.

## Triple-Expansion Vertical Engine of the General Electric Company.

The display at the World's Fair made by the General Electric Company of New York embraces several departments and locations, and is of a magni-

electrical features the machine is of the Edison system, and the construction throughout was designed by J. C. Henderson, engineer-in-chief of the company. Owing to the crowded condition of the company's shops, and in order to insure its timely completion, the construction of the engine was in-

ponent of the armature-driving engine of the future. That is to say, the direct application of the steam power to the armature shaft, through the medium of three 120° cranks, gives an equalization of strains and steadiness of motion which are absolutely essential to the attainment of best results; and, further-



TRIPLE-EXPANSION ENGINE OF THE GENERAL ELECTRIC COMPANY AT THE WORLD'S FAIR.

tude which would of itself constitute it an exhaustive exposition of the wonderful growth and development of electrical science in nearly all of its various industrial and scientific applications. One of the leading features of the exhibit is the 1000 horse-power triple-expansion vertical engine, with two direct connected multipolar generators of 400 k. w. each, located near the southeast corner of Machinery Hall. In its

trusted to the Southwark Foundry & Machine Company of Philadelphia, by whom it was also erected, under the supervision of Mr. Russell of the Electric Company. Broadly considered, it is safe to say that for electrical purposes the general principles involved in the design of this type of engine render it so admirably adapted to the peculiar requirements of such duty that it may be regarded as an advance ex-

more, the machine as a whole is entirely self-contained, and all working strains, even under maximum load, are within itself and independent of foundations and all extraneous parts or conditions. By use of the triple-expansion principle a maximum of steam economy is possible, and the proper proportioning of the three cylinders insures an equal application of power to each of the cranks, which admits of the fly wheel



being dispensed with entirely, notwithstanding the fact that the mechanical resistance of the armatures is a steady

As shown in the accompanying illustrations, the engine is of the vertical cross-compound type, having automatic

supported by either end of the main foundation box and bed plate of engine; while the armatures are keyed to over-

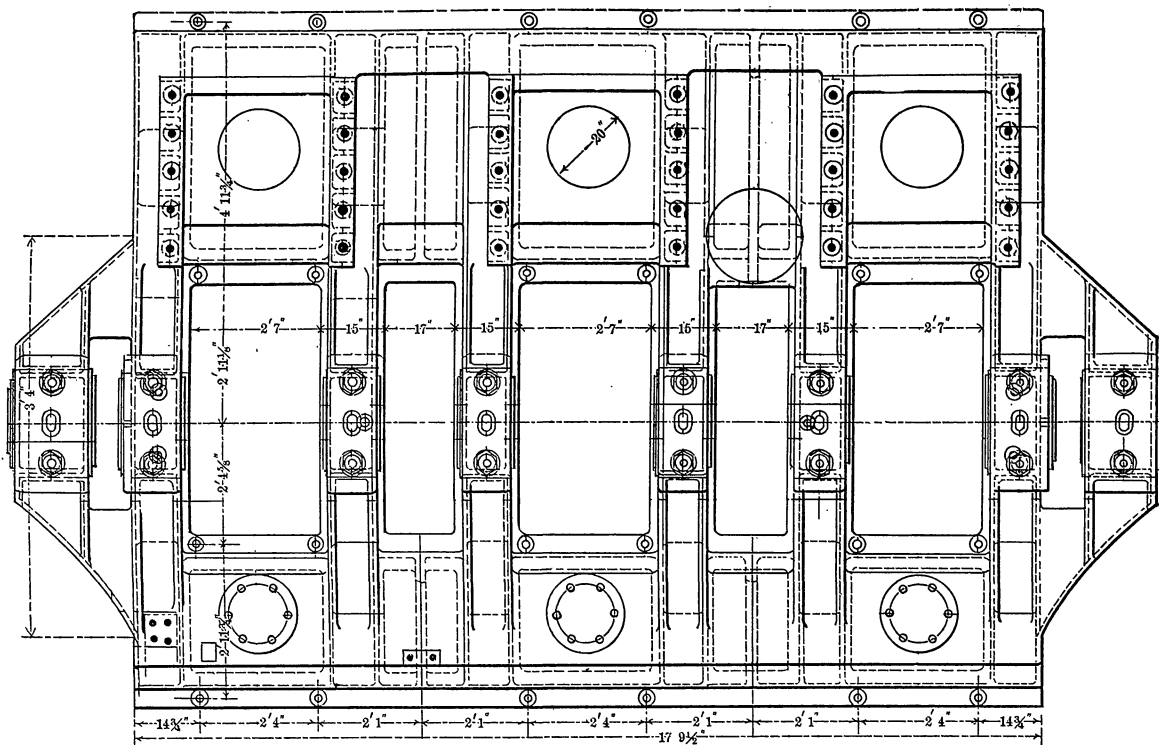


Fig. 1.—Plan of Engine Bed Plate.

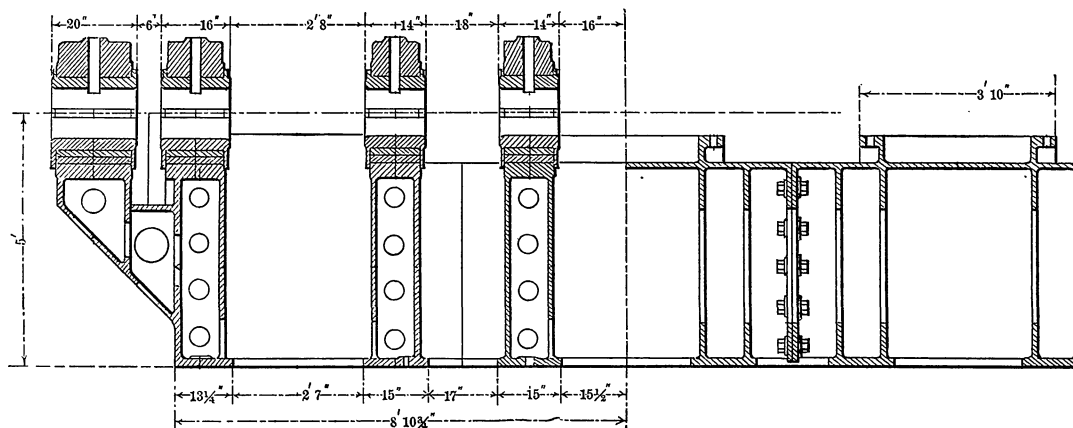


Fig. 2.—Longitudinal Section of Engine Bed Plate.

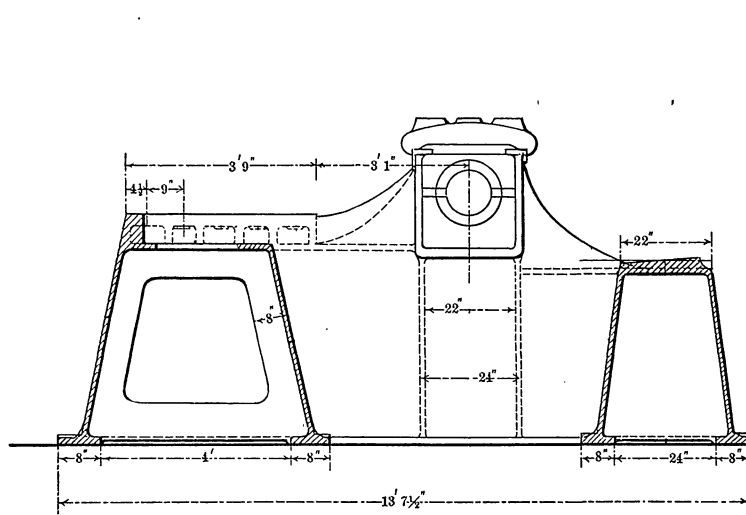


Fig. 3.—Cross Section of Engine Bed Plate.

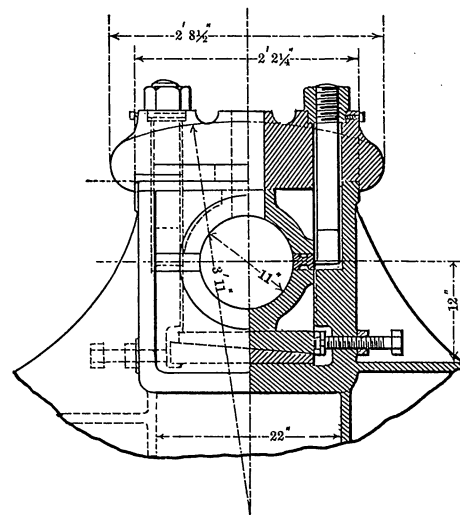


Fig. 4.—Main Pedestal Bearing.

#### TRIPLE-EXPANSION VERTICAL ENGINE OF THE GENERAL ELECTRIC COMPANY.

drag on the engine, which only evenly spaced multiple cranks could overcome unaided.

regulation by means of a modified Corliss valve gear. The field housings of the two generators are placed at and

hung ends of the crank shaft—thus rendering them easily accessible for manipulation, inspection and repairs.

The engine is substantially of the marine type, it being well adapted to such service without any change whatever, as the automatic regulating mechanism is of such construction as to be unaffected by changes of position of engine from motion of the vessel. There are several novel features in the general design; the most noticeable being that the housing, instead of the usual A-frame uprights, consists of three heavy back columns or half A's carrying the cross-head guides, and a corresponding number of comparatively light front columns of cylindrical

this arrangement the percentage of valve clearance is reduced below the smallest limit possible by the best practice, where they are ported through the cylinder walls in the ordinary manner. Nearly all the details of valve actuating and regulating mechanism are radically different from the ordinary designs followed by builders of Corliss engines, and are, in fact, peculiar to this particular pattern of engine. As will be noticed from examination of the perspective engraving, the universal external dash pots are conspicuous by

and withdrawn at pleasure. They are incased in 4-inch wrought-iron pipes, the latter being centralized at bottom by a recess in washer boss. As the bolts are 2 inches diameter and the washers 18 inches square, a very secure hold is afforded—probably far in excess of what is actually required to prevent movement of the foundation box, to which the bed plate proper is bolted. The general dimensions of the foundation box are 28 feet 6 inches long, 17 feet 10 inches wide and 4 feet deep. The four corner extensions serve as the

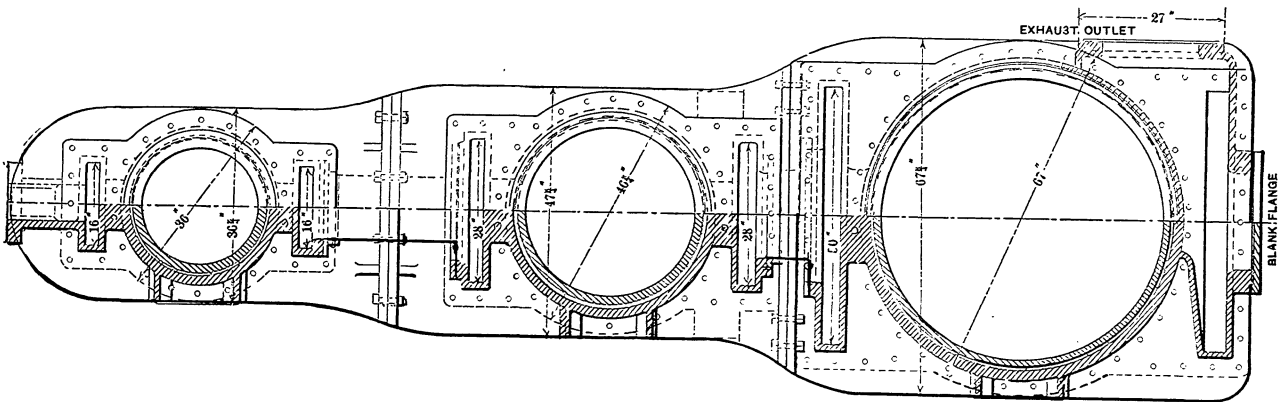


Fig. 5.—Horizontal Section and Plan of Cylinders.

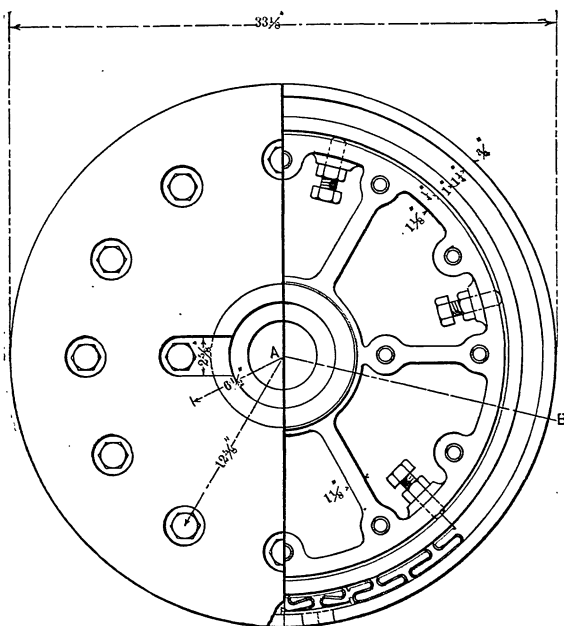


Fig. 6.—Plan of Piston.

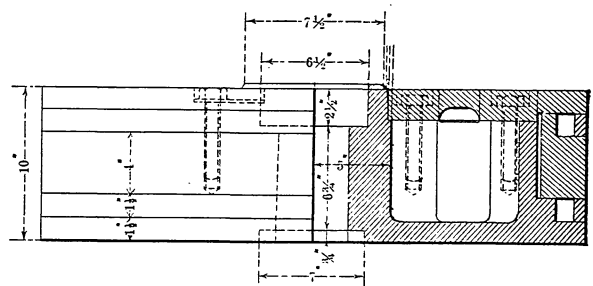


Fig. 7.—Side Elevation and Section of Piston.

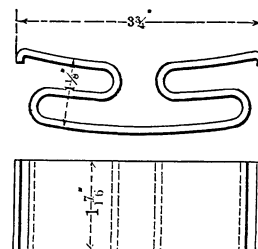


Fig. 8.—Piston Spring.

# TRIPLE-EXPANSION VERTICAL ENGINE OF THE GENERAL ELECTRIC COMPANY.

section, set at the same angle of inclination as the back columns. While in no wise affecting the necessary stiffness or stability of the housing, this modified form of construction possesses undoubted advantages, not the least of which is the perfectly unrestricted accessibility of all working parts from the main bearings to the piston rod stuffing boxes.

The delivery of steam from the high-pressure to the intermediate and low pressure cylinders is by direct connections, without the interposition of receivers or reheating apparatus of any kind. Another novel feature of the engine is the location of the steam and exhaust valves, which are placed in the top and bottom cylinder heads, and by

their absence, and the entire valve gear is of the most admirable simplicity.

In the photograph from which the engraving was made it was, of course, impossible to obtain a point of view which would include in the picture all of the essential details. Those in the rear were, therefore, necessarily sacrificed, but are fully shown in the detail drawings herewith, which include, also, all features which in themselves or in their combinations are peculiar to this engine. As the subject is so profusely illustrated a brief description will suffice, reference being made to the drawings, as nearly as possible, in their consecutive order. The holding-down bolts are screwed into the deep boss of washer, and can therefore be inserted

main bed plate of generators, the field housings of which are bolted directly to them. The central portion—17 feet 9 1/4 inches by 13 feet 7 1/4 inches—supports the bed plate of engine. The box is made in three sections, and bolted together by turned body-bound through bolts and nuts. The engine bed plate, Figs. 1 and 2, is in reality merely supplementary to the former, and pertains entirely to the engine, the columns and pedestals of which it supports. The bearings for the front and the rear columns of engine housing are seen in the transverse section, Fig. 1. The former are planed, Fig. 3, to give the proper angle of inclination to the cylindrical columns, the ends of which are squared in the lathe. This arrange-



ternal bearing surfaces of the bushings or cylinder linings being concentric with the bore admits of their being renewed without difficulty, while the manner of their insertion admits of their being readily withdrawn for re-boring or renewal. The entire length of bore of the linings is used as piston bearing, as the counter bores are formed in the recess in heads, which are but  $\frac{1}{8}$  inch larger in diameter. In the two sectional views the steam passages, from throttle to exhaust outlet, are readily followed, those on left hand side of each

external radiation, &c. A very important consideration in this form of construction is the fact that all cored passages are straight and open from end to end, and therefore readily accessible for cleaning out all sand and abrasive matter, which so frequently causes disastrous results after the engine is put in operation. The top and bottom cylinder heads, while for the high-pressure cylinder, are in all essential features similar to those of the intermediate and low pressure. The course of steam passages to the valves and from the latter

0.01488, or 1.488 per cent., say  $1\frac{1}{2}$  per cent., including one half of clearance of piston rod nut in recess in top head. The importance of this item in compound expansion will be readily appreciated.

In Figs. 6, 7 and 8 the pistons and their several details are shown. The most important feature is the large amount of bearing surface afforded by the heavy adjustable ring interposed between the two packing rings. By this arrangement, as the piston may be kept accurately centered in the cylinder,

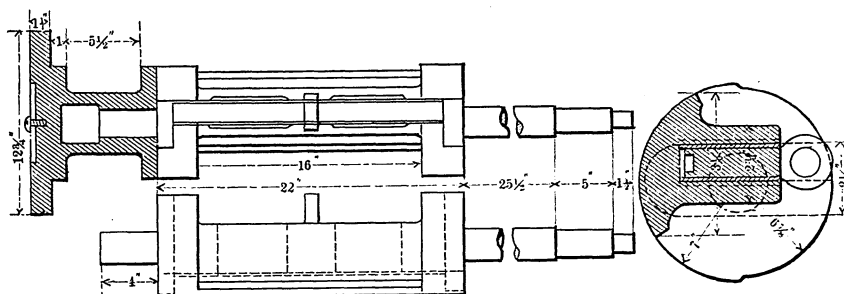


Fig. 14.—High-Pressure Steam Valve.

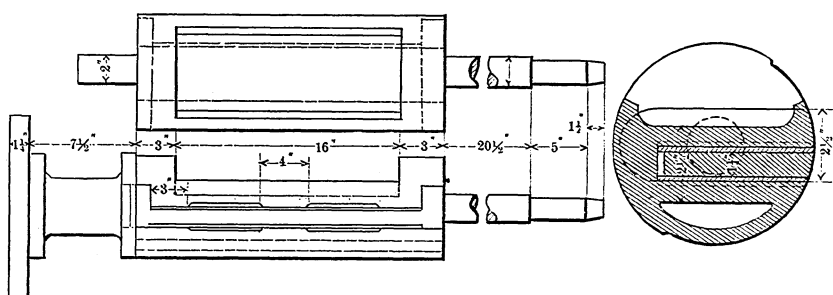


Fig. 15.—High-Pressure Exhaust Valve.

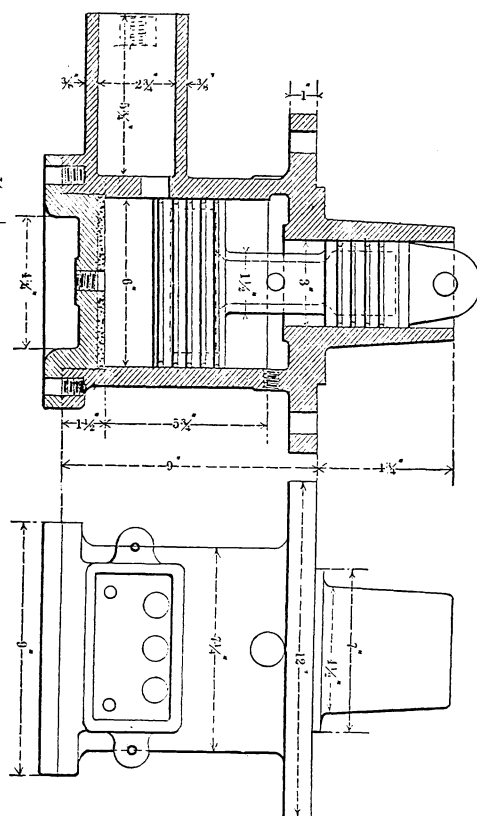


Fig. 16.—The Dash Pot.

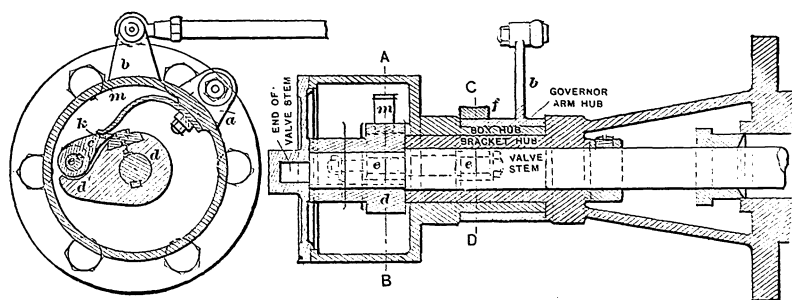


Fig. 17.—Release Gear.

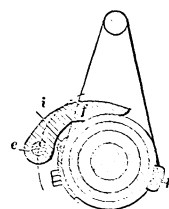


Fig. 18.—Section C D, Fig. 16.

### TRIPLE-EXPANSION VERTICAL ENGINE OF THE GENERAL ELECTRIC COMPANY.

cylinder being the steam and on the right the exhaust. The method of compensating for inequalities of expansion consists simply of a  $\frac{3}{8}$  inch copper diaphragm of sufficiently large diameter to afford the necessary spring, within its elastic limit. While all passages are of ample sectional area to prevent frictional resistance to the flow of steam, they are not made unnecessarily large, in order to prevent undue loss of heat from their external radiating surfaces.

The entire absence of steam (or exhaust) jackets to the cylinders will be noted, the air space formed by the air-tight casing surrounding the group being depended on as an efficient and more economical method of preventing the loss of heat by

to cylinder is well calculated to obviate friction, while the port clearance is almost nil in comparison with volume of piston displacement. Small as it is, however, the piston clearance is no greater. The total percentage is as follows: The two ports have a mean width  $2\frac{1}{2} + 2\frac{3}{4} = 2\frac{1}{2} \times \text{depth of } 1\frac{1}{2} \times \text{length}$

of 16 inches =  $52\frac{1}{2} \times 2 = 105$  cubic inches. For piston clearance ( $\frac{1}{8}$  inch) we have cubic volume of counterbore (area of  $22\frac{1}{2}$  inches =  $402 \times 2 = 804$ ) — (area of piston  $22\frac{1}{2} = 397.6 \times 1\frac{1}{4} = 696$ ) = 108 cubic inches, which + 105 for ports = 213 cubic inches. The piston displacement —  $397.6 \times 36 = \text{say } 14,314$  cubic inches; then  $\frac{213}{14,314} =$

and the packing left perfectly free to expand uniformly under pressure of springs, the latter will keep tight without undue friction, and the wear of both piston and cylinder bore is reduced to a minimum. The method of preventing leakage through joint in packing rings is shown in the top sectional view.

Figs. 9, 10 and 11 represent the piston and connecting-rod and cross-head details. The connecting rod, Figs. 9 and 10, is provided with an ordinary English type of stub end as being best suited to the large diameter (11 inches) of pin of the drag cranks. The wrist end of rod is forked, but is peculiar in having plain eyes in place of the ordinary double stub ends. The wrist pin is fitted rigidly in the eyes, and oscillates

with the vibration of rod. The piston rod and body of cross head, Fig. 11, will admit of double the lift required and therefore a given area of opening with any ordinary form of valve. The

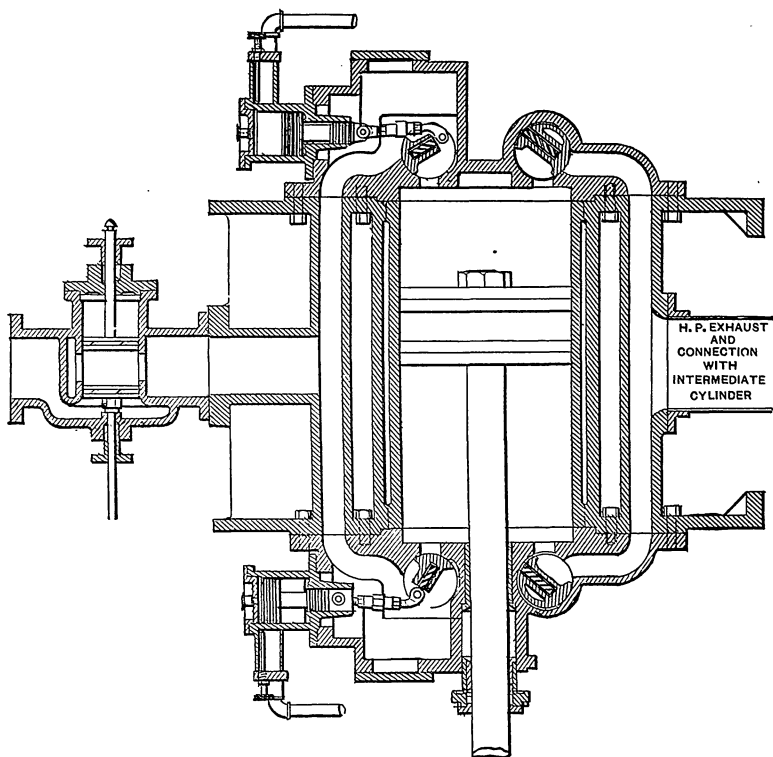


Fig. 19.—The High-Pressure Cylinder.

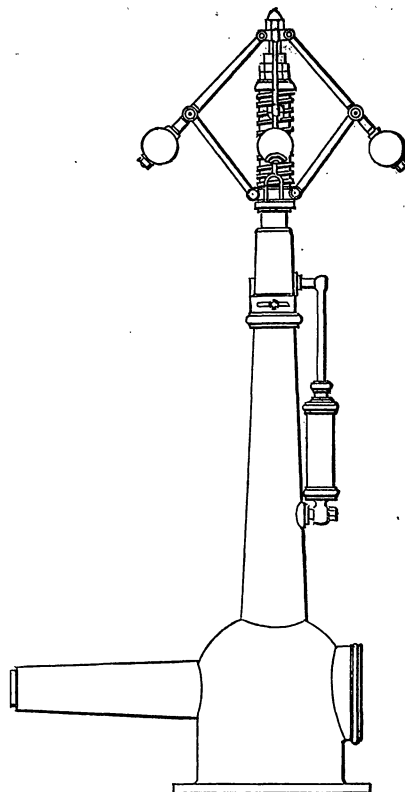


Fig. 20.—The Governor.

are combined in a single forging of mild steel. The guide side of the latter is planed taper to correspond with adjusting wedge of the bearing shoe, which is of phosphor bronze, its bearing surface being 24 x 13 inches. The construction of wrist-pin bearing is substantially that of an English stub end, it being provided with divided boxes and heavy bolted caps. A very large amount of bearing surface on wrist pin is thus obtained without the necessity for making the end of connecting rod inconveniently large, while at the same time the adjustment of the boxes is very easily made. While the pin is 6½ inches diameter by 9 inches length of bearing, the extreme dimensions of forked end are but 13½ inches by 15½ inches at the eyes, and the thickness of cross head but 7 inches.

The essential feature of the gland for the piston-rod stuffing box is shown in the method of setting up on the packing by means of spur pinions on stud nuts and ring gear on body of gland, thus transmitting the motion from one nut to the other and insuring perfect parallelism, which gives uniform pressure on the packing and prevents the possibility of gland binding on the rod from careless setting up. Fig. 12 shows the construction of crank shaft, disks, &c., and the relative positions of the three crank pins. The throttle valve is shown in Fig. 13.

The steam enters at the left hand. It surrounds the valve cylinder, which, when the piston valve is raised, it enters through several angular ports, and passing downward is discharged to the engine through the right-hand opening. The piston is constructed with a long solid head, and a bolted follower and two packing rings at both top and bottom. It is, of course, perfectly balanced against the steam pressure, and from the arrangement of ports the admission of partial steam is effected with much less friction and wire drawing than is possible with a valve having a continuous opening. The ports are less than

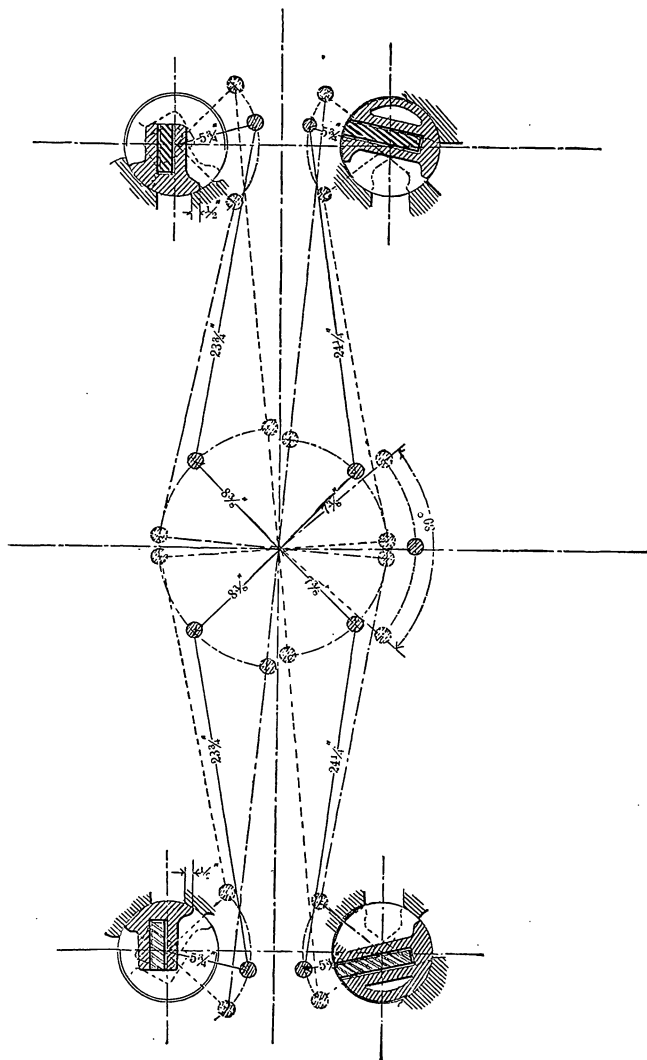


Fig. 21.—Analysis of Valve Motion of H.-P. Cylinder.

TRIPLE-EXPANSION VERTICAL ENGINE OF THE GENERAL ELECTRIC COMPANY.

Corliss wrist plate is provided with an arrangement for taking up the lost motion resulting from constant wear. A split conical bushing of phosphor bronze is fitted in the bore and is set up as required by a screw collar, the latter being retained in its adjusted position by two dowel pins in stud washer. A ball bearing is necessary in place of the ordinary pin, by reason of the position of the rock shaft, the axis of the latter being at a right angle to that of the wrist plate, which gives two directions of vibration.

The high-pressure steam and exhaust valves shown in Figs 14 and 15 are the same in all essential features as those for the intermediate and low-pressure cylinders. Their construction is most clearly seen in the enlarged central cross sections. Unlike most valves of the Corliss type, the stems are carried through to the opposite end and have an outer bearing in back bonnet, while the valves proper are left entirely free except in the direction of their operating motion. The eye shown attached to stem at center of length of steam valve is for connecting to the dash pot pistons, as more clearly seen in Fig. 19. The details of the dash pot are given in Fig. 16; and their location and action with relation to the valves would appear to insure prompt and noiseless closure. The opening is, of course, against the pressure of steam on the smaller piston, which therefore effects the closure at release; while the cushioning action of the large piston prevents jar or recoil. The leather cushion against head of large cylinder is merely a precautionary measure to prevent slamming in case of improper adjustment of the cushion valves.

In Fig. 17 the release gear is shown, though not so fully but that a brief explanation of its action may be desirable. The rod connection to wrist plate is made at arm *a* and rotates the cylindrical box to the right, and by means of pawl *c* in contact with shoulder *b* opens the valve. On the outer end of pawl shaft *e* is the lever *f*, the free end of which in the forward movement of *a* comes in contact with stop *h*, which raises it and releases the pawl, when the valve is closed by pressure on dash-pot piston. The position of *h* with relation to *f* is regulated by the governor through arm *d* and the necessary rod connections, the adjustment being made to effect the release for the desired point of cut-off when the proper speed of engine is reached, as is, of course, the case with any form of release valve automatic cut-off. The arm *d* is provided as a supplementary means of closing the valve, in case, from any cause, the dash pot should fail to do so. It is accomplished by pawl *c* at return movement of box. The entire valve and regulating mechanism is extremely simple in construction and is necessarily equally reliable in its action.

Fig. 19 gives a comprehensive view of the arrangement of high-pressure cylinder, its lining, top and bottom heads, dash pots, throttle, &c. Fig. 20 shows the general features of governor, the details of which are unnecessary. It is driven directly from crank shaft by means of a single pair of bevel gears, and being of the high speed type, the centrifugal parts are correspondingly light. The four arms give a good distribution of working strains as well as a very perfect balancing effect, which renders the governor well adapted to marine duty, as even a very great angle of variation of its axis from the vertical will not have any appreciable effect on its operation.

Fig. 21 is a diagram showing analysis of the valve motion of the high-pressure cylinder; giving the position of valves, wrist plate and valve arm pins for the two extreme and mid positions of eccentric travel.

Considering all of the foregoing details of construction, as well as many not referred to, this engine gives evidence of very careful calculation in its design, and, so far as can be judged from this fact and the record of its performance up to the present time, it appears to be well adapted to the exceptionally trying duty of driving a pair of direct-connected armatures. With the single exception of its World's Fair uniform of white paint, the entire plant presents a very handsome appearance, and it attracts the interested attention of a large number of visitors.

### Duluth News.

It had been hoped to print in *The Iron Age* a detailed and particular account of the Mesaba consolidation, and the story had been held under pledge for weeks by the Duluth representative of this paper, but it became a settled fact at the wrong time of the week. These particular details, however, have in no case been given, and they are well worth note. The new company buy and pay for with their own stock a 51 per cent. interest in some mines, a 75 per cent. interest in others, and a complete ownership of still others. For transfer purposes Mountain Iron Company stock goes in at \$218.19 per share, or 4.36 shares of Consolidated for one of Mountain Iron; 51 per cent. is taken over. Biwabik goes in at \$96.97, or 1.93 for one; 51 per cent. is taken here also. Missabe Mountain, of which the same amount is taken, goes in at \$68.40, being 1.37 shares to 1. Shaw, on a 75 per cent. basis, goes in at \$13.33 per share, or 0.26 share for 1. Great Northern and Great Western, both of which go in entire, are respectively on a basis of 0.28 and 0.16 share to 1 of Consolidated. Of Adams, 51 per cent. going into the Consolidated, stock is 1 to 1. Rathbun, an unstocked mine, is put in at \$2,500,000 Consolidated stock, presumably at par. The Lake Superior Lone Jack leases are also in, the former at about 0.32 to 1. All of McKinley goes in, fee and lease, at \$1,000,000. Of the above all but the last five are what is known as Merritt mines, having been largely exploited by the Merritt brothers. So far about \$17,000,000 of Consolidated stock is in sight.

In addition to these the Lowmore, Shannon, Mesaba Chief and others are under negotiation for purchase by the Consolidated, and will have been accepted or left out before this letter is printed.

This is a big combination, to be sure, but there have been some wild statements made on it. In this line not one of the correspondents who sent out matter concerning the concern made such a ridiculous break as is reported from Lon Merritt, its president, who, when interviewed in New York, said the company would be able to make a profit of \$2.95 a ton "by reason of economies in mining, handling and transportation." Nobody had supposed that mining, handling and transportation could be had by the Consolidated for nothing.

It is rumored that the new company have already made contracts with a number of large consumers of ore for a term of years whereby they are assured of a

steady business of no little importance. Whatever may be the cause, the shipment of ore from the Mesaba has largely increased since the negotiations for the combine were so far settled as to allow sales to be made. In the past four days 16 cargoes have left this city, an aggregate of over 25,000 tons, a greater four days' business than at any time since shipments off the range began. A sale of 300,000 tons of Mesaba ore is reported, to be sent from Mountain Iron this fall. Next year, should the market resume its wonted activity, shipments will probably tax the single-track road and the ore dock, with its capacity of 3,000,000 tons, to the utmost. Work has resumed on completing the dock ready for enlarged shipments, and there is talk of a double track on the entire line.

It has been reported in the columns of the daily papers that an opposing combination was to be organized by the Minnesota Iron Company, to include their present (four) Mesaba properties, their railway and a number of additional mines. This is denied by the Minnesota officials here. That such a project is in view is, however, quite probable, and the Minnesota would be the natural nucleus for the consolidation. At the west end of the range are many valuable properties conveniently located with respect to each other, and there is a competing railway, partly belonging to the owners of the mines there that have not gone into the syndicate.

The effect of the new deal on the Vermillion Range and the Minnesota Iron Company has been considerably speculated on, but with an evident feeling that the older concern was out of the field. It is an absurdity to believe, as so many seem to, that any such corporation as the Minnesota Iron Company is to "lie down" because of opposition, however powerful, without a struggle. The company have spent a great deal of money this summer in perfecting their machinery and mining methods and now claim to be able to put their high-grade hard ore, crushed, on cars at less than \$1.40 a ton. Furnacemen are accustomed to the ore and like it; no heavy royalties are paid, and the company's guarantee of 66 per cent. has always proven good. The Minnesota Company's mines will be by no means out of the field, though their leading position is lost.

Niles, Ohio, is rapidly developing into an important center of the iron and steel roofing trade. The latest concern added to the list is one under the control of C. B. Cill of the Chicago Roofing Company, Chicago, Ill. It will probably cause as much surprise among roofers as it did among the citizens of Niles. Nothing was publicly known of the enterprise until Tuesday, September 5, when three acres of ground adjacent to the Russia Mill were purchased and grading commenced the same day. The building, 200 x 60 feet, is now in course of erection. It is stated that 25 men will be employed. The other roofing manufacturers at Niles are: Sykes Iron & Steel Roofing Company, Niles Iron & Steel Roofing Company, Curtis Steel Roofing Company, Niles Spouting & Roofing Company, all of whom are doing good business. Another sheet-metal working concern at Niles is the Niles Mfg. Company, makers of Galvanized eave trough, conductor pipe and patent plastering lath. There are seven sheet mills in this vicinity to supply the demands from these factories.



### The De Laval Steam Turbine.

The steam turbine manufactured by Gustaf De Laval of Stockholm, Sweden, and now on exhibition at the World's Fair, has attracted wide attention because of the novelty of its design and the excellence of its performance. It is located at the Swedish Section, K 22, Machinery Hall, and is in charge of Reinhold Hornell, who is the inventor's representative in the United States.

De Laval's steam turbine is in principle exactly similar to the well known axial-jet turbine for water, being so arranged that the steam has acquired the same pressure as the surrounding atmosphere before reaching the turbine wheel, thus converting its entire capacity for work into momentum. The steam then passes between the blades of the turbine at a constant relative velocity and in a clear jet without any disposition to further change its pressure or specific gravity. The consequence is that the movement of the steam in the turbine is according to the same laws as for water, and the blades of the turbine can therefore be constructed in the same manner as if designed for water.

An illustration of De Laval's steam turbine is shown in Fig. 1. The nozzle is directed against the plane of the turbine at quite a small angle and tangentially against the circumference of the medium periphery of the blades. The angle of the blades is the same at the side of admission and discharge. The width of the blade is constant along the entire thickness of the turbine.

As has already been mentioned, the steam has expanded to the pressure of the surroundings before arriving at the blades. This expansion takes place in the nozzles, and is caused simply by making its sides diverging. As the steam passes through this channel its specific volume is increased in a greater proportion than the cross section of the channel, and for this cause its velocity is increased, and also its momentum, till the end of the expansion at the last sectional area of the nozzle. The greater the expansion in the nozzle, the greater its velocity at this point. A pressure of 75 pounds and expansion to an absolute pressure of one atmosphere give a final velocity of about 800 M. (2625 feet) per second.

The smallest sectional area determines the quantity of steam discharged, and the proportion between the areas at each end of the nozzle determines the extent of the expansion and the final velocity of discharge. If the last sectional area is too small the steam does not expand fully in the nozzle or obtain its maximum velocity. In this case the steam has a higher pressure at the point of discharge than the surroundings, and the jet will spread out. On the other hand, if the proportion between the sectional areas is gauged so that the expansion is complete, the steam will be discharged in a collected jet and continue for quite a distance from the nozzle without being broken up. To a lower pressure than the surroundings the steam cannot be made to expand. If therefore the last sectional area is too large, the steam will be discharged at a reduced velocity. This, of course, results in a loss of momentum and energy in the steam, and should therefore be carefully guarded against. From what has been said, it is evident that all necessity of tightening against steam pressure ceases at the end of the nozzle. In this consists one of the advantages of De Laval's steam turbine above all other constructions where steam is admitted

to the turbine under pressure, and consequently leaks out to all sides instead of passing through the turbine wheel. The live steam does not come in contact with any of the working parts of the turbine, and the machine therefore works equally well with superheated as with saturated steam. Here is also an opportunity for economizing heat, which is impossible in ordinary steam engines on account of the sensitiveness of the packing boxes to heat.

Expansion is carried further in this steam turbine than in ordinary steam engines. This is on account of the steam expanding completely during its work to the pressure of the surroundings.

Figs. 3 and 4 show a 5 horse-power (effective) steam turbine in horizontal and vertical section. Steam is admitted through the inlet pipe on top of the turbine box, where the governor valve is placed. Entering the turbine box, it is conducted through the steam channel to the two nozzles through which it reaches the turbine. It then passes between the blades of the turbine wheel and through holes in a separating plate to the discharge opening at the back of the turbine box, and from there through an exhaust pipe out into the open air.

For obtaining the greatest possible effect, it is known from the water turbines that the admission to the blades must be free from blows and the velocity of discharge as low as possible. These conditions would require in the steam turbine an enormous velocity of periphery—as high as 1800 to 1650 feet per second. The tension of the material of the turbine caused by the centrifugal power, nevertheless, puts a limit to the use of very high velocities. In the 5 horse-power turbine, shown in illustration the velocity of periphery is 574 feet per second, and the number of revolutions 30,000 per minute.

To make certain of the steam jet not striking the back of the preceding blade, a small angle of impact is allowed on the front of the blade, but steam being a perfectly elastic material, no noticeable loss of effect need be apprehended from this source. On account of the too low velocity of periphery, the velocity of the discharge steam is rather high, and is used to create a vacuum in the turbine box, this being accomplished by giving to the holes in the separating plate a form suitable for ejector action. By means of this vacuum the friction resistance of the air to the turbine is reduced, and a greater degree of expansion made possible in the nozzles.

The turbine is manufactured from the best quality of steel, the blades are cut in one piece with the body of the turbine by means of a milling machine. A steel ring is then shrunk on outside of the blades. This ring prevents the steam from passing over the ends of the blades, and removes the tendency of the turbine to act as a fan, thereby preventing the resistance which would be due to such action.

The most characteristic feature of the De Laval steam turbine is, perhaps, its great speed. Very great difficulties have confronted the inventor in overcoming the difficulties resulting from it. However carefully the turbine may be manufactured it is impossible, on account of unevenness of the material, to get its center of gravity to correspond exactly to its geometrical axle of revolution; and however small this difference may be, it becomes very noticeable at such high velocities. De Laval has, nevertheless, succeeded in solving the problem by providing the

turbine with a flexible shaft, Fig. 5. This yielding shaft allows the turbine at the high rate of speed to adjust itself and revolve around its true center of gravity, the center line of the shaft meanwhile describing a surface of revolution. If the shaft were stiff, the vibrations of the turbine wheel would be communicated to the bearings, which would then run warm and cut. The purpose of allowing an adjustment of the wheel can also be accomplished by making the journals yielding; but this arrangement requires complicated and expensive details of construction. The bearing at the free end of the flexible shaft is provided with a ball fastening in order to allow it to adjust itself to the shaft. Moreover, all the journals are provided with lubricating grooves and anti friction metal, thus being specially adapted for effective lubrication.

In the gearing box the speed is reduced from 30,000 revolutions to 3000 by means of a driver on the turbine shafts, which sets in motion a cog wheel, Fig. 8, of ten times its own diameter. These gearings are provided with spiral cogs, carefully cut and placed at an angle of about 45°. On account of the high velocity, all tensions caused by the transmission of power are very slight. Consequently the cogs can be quite small, which is one of the conditions for even running of the gearing. The shaft of the larger cog wheel, running at a speed of 3000 revolutions, is provided at its outer end with a pulley for the further transmission of the power. The small pulley on the end of the shaft is intended for the belt to the tachometer.

The governor, Fig. 6, is attached to the inner end of the shaft of the larger cog wheel and is of new and original construction. The frame is provided with a slightly conical pin, by means of which the governor is held in a corresponding hole in the shaft. The segment weights or wings are movable on edges thus with the least possible friction. When the governor revolves the weights diverge, their inner ends push a pin forward, this pin in turn causing the cut-off of the valve. A spiral spring is inclosed in the governor and keeps the weights in a state of equilibrium at a speed of 3000 revolutions. It consequently corresponds to the weight of the collar on pendulum governors. The spring is set at a pressure of about 44 pounds. At an increase of speed of 1 per cent. above 3000 revolutions the strength of the governor is equal to 2 per cent. of the total tension of the spring, or— $q = 0.02 \times 20 = 0.4$  kg. (= 0.88 pound), provided that the wings remain in their original position. The governor is inclosed in a metal box to protect it from dust. By means of a lever the movement of the governor pin is transmitted to the governor valve.

Oil for lubrication is furnished from the two oil cups shown in Figs. 3 and 4. In the lower part of the gearing box waste oil from the four bushings collects, as also oil from the cog wheels. It is drawn off by means of a small cock.

The practical advantages which characterize the steam turbine as against the oscillating engine are: Simplicity of construction, very small passive resistance, small space, small weight, and a very regular speed. This last property is a consequence of the continuous admission of steam to the turbine wheel, and the equalizing effect of the rapidly revolving parts of the engine. Furthermore, the governor is here in readi-

ness for instant effect on a variation of the load, and does not, as is the case with piston engines, have to wait until the slide valve admits steam to the cylinder next time.

One of De Laval's turbine dynamos of 30 horse power is shown in Fig. 7. Here the shaft of the turbine is geared to two cog wheels. The dynamo has two inductors, the shafts of which are

down. The shaft of the turbine is thus exposed only to torsional tension, and the pressure on the journals is reduced to a minimum, corresponding to the weight of the driver with its shaft. The wires of the two inductors can be coupled at liberty in a series or parallel. The dynamo differs in no essential manner from the well known Manchester type, with the exception of its speed of

easily accessible for removal and exchange, if required. The journals and gearing are lubricated from the oil cups on top of the gearing box. The governor valve has double seats and is balanced by both seats being of equal diameters. Above the valve is a sieve of wire cloth, which prevents the steam from carrying dirt from the pipe into the governor valve. The governor it-

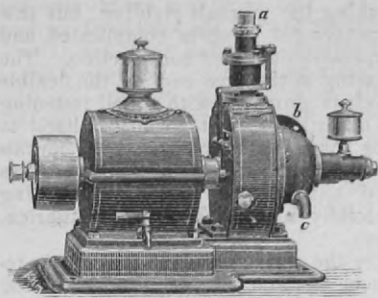


Fig. 1.—Perspective.—a, Steam Inlet.—b, Steam Exhaust.—c, Condensed Water.

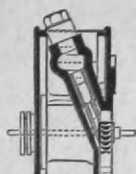


Fig. 2.—Nozzle and Turbine Blades.

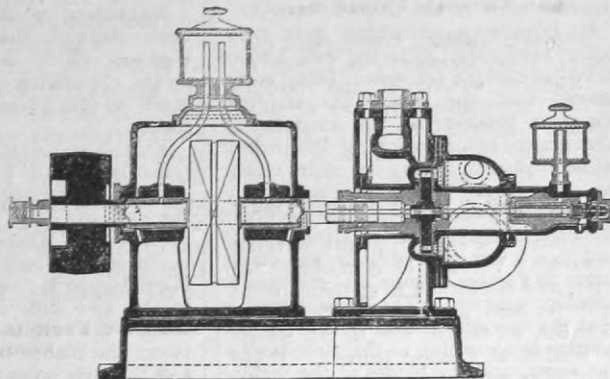


Fig. 4.—Vertical Section.

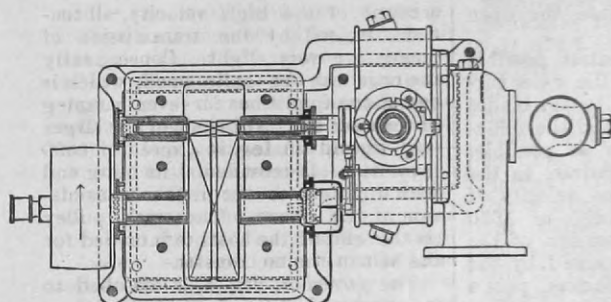


Fig. 3.—Horizontal Section.

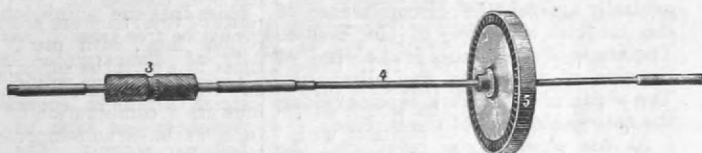


Fig. 5.—Shaft with Turbine and Driver.

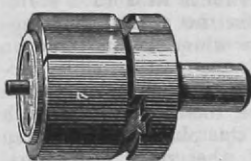


Fig. 6.—Governor.



Fig. 9.—Turbine Wheel.

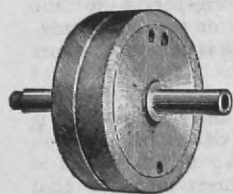


Fig. 8.—Cog Wheel.

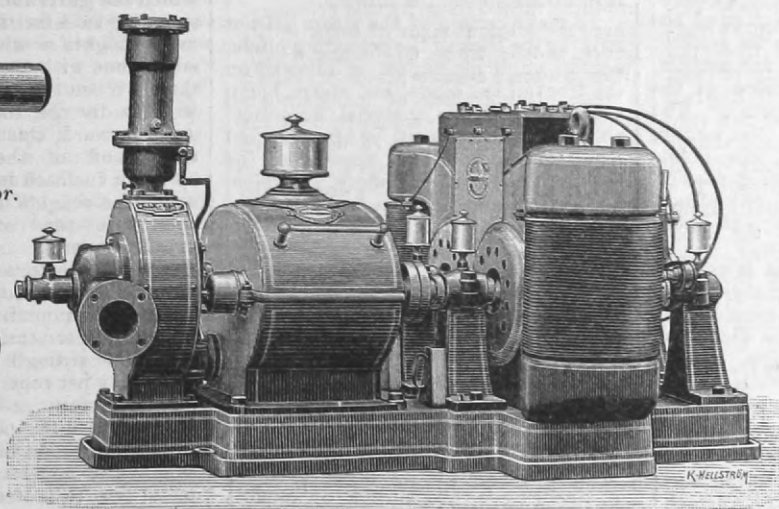


Fig. 7.—Combined Steam Turbine and Dynamo.



Fig. 10.—Nozzle.

#### THE DE LAVAL STEAM TURBINE.

directly coupled to the shafts of the two cog wheels of the turbine. Magnets and yoke are common to both inductors. The pressure on the journals is here counterbalanced electrically. This is accomplished by the winding of the inductors, this being done so that each produces one-half of the total energy passing through the main conduit (amounting to 19.8 kilowatts). The pressure on the cogs on each side of the driver is therefore the same, but on one side is directed up and on the other

2000 revolutions per minute. On this account some safety arrangements have been made with regard to the strength of the inductors or collectors.

The turbine box contains eight nozzles, of which four can be opened or closed by means of independent valves, according to the power required. The more exact regulation is effected by the governor. The turbine therefore can be made to work at the same pressure and degree of expansion even if the effect is varied as 2:1. The nozzles are

self is of the same construction as the one shown in Fig. 6, but somewhat longer. Its power is 4.85 pounds at an increase of speed of 1 per cent. above normal speed. This machine is intended to work with condensation. A vacuum is obtained by means of any ordinary condenser. The nozzles are strongly divergent toward the opening, and the entire turbine box made perfectly tight.

The economy of the De Laval steam turbine is proved by numerous tests, of which one lately made by engineering-

experts with a 50 horse power turbine dynamo showed that an effect of 63.7 horse-power was obtained with a consumption of steam of 19.73 pounds, and a consumption of coal of 2.67 pounds per hour per horse-power.

## WORLD'S FAIR NOTES.

### The Swedish Catalogue.

The Royal Swedish Commission have issued a very complete catalogue for the Swedish section of the World's Fair. It is published in two volumes. Volume I contains 62 pages, giving a description of the construction of the Swedish Building, the names of the members of the Royal Swedish Commission and a full list of the exhibits, mentioning the special points covered by each. Volume II comprises 240 pages, and is devoted to statistics compiled for the purpose by Dr. S. A. Löfström, actuary of the Royal Swedish Statistical Central Bureau. These statistics relate to a great variety of subjects—geography, geology, population, physical and moral condition, trades, natural products, industries, &c. Of great interest and value is a chapter on the metallurgy of iron and steel by Prof. J. Wiborgh. In this chapter the processes employed in the manufacture of iron and steel in Sweden are described in detail. During 1891 there were at work 155 blast furnaces, principally using charcoal, in which were produced 500,000 tons of pig iron, with an average daily yield per furnace of 12.2 tons. The ore used is generally calcined, partly for evaporating sulphur, partly to make the ore more porous and easier to reduce, and only exceptionally specular ore is used uncalcined. The calcining is done by furnace gas in Westman's calcining furnaces. At some works castings are produced directly from the furnace. In the manufacture of castings from cupolas a mixture of English and Swedish pig is used, but for very soft castings English pig is used almost exclusively. Most of the wrought iron produced is refined in hearths. The Lancashire process is the most used, but the Franche-Comté and the Walloon process are also employed. The production of wrought-iron in 1891 was 193,500 tons, of which 181,000 tons were made in Lancashire, 7500 tons in Walloon and 5000 tons in Franche-Comté hearths. The fuel used in these hearths is charcoal. Heating furnaces are gas fired, the gas being produced from mixed coal and wood, or charcoal, peat and wood, sawdust, &c. The puddling process is used but little in Sweden. Some puddled steel is made. There are 15 Bessemer works, which turned out 93,000 tons in 1891, manufactured into plates, rails, nail rods, wire, &c. The works using Siemens-Martin steel furnaces comprise 22, which produced 78,200 tons in 1891, using for fuel coal, peat, wood or sawdust. The steel from these furnaces is manufactured into castings, plate, wire, horseshoe nails, &c. Blister steel is produced at a few works and crucible steel at only two. The Jernkontoret, or Swedish Association of Swedish Iron Masters, was founded in 1745, and nearly all the Swedish iron and steel manufacturers are members. Its object is the promotion of the Swedish iron industry, which it effects by advancing money to its members to assist them in extending their works, and also by making appropriations for experiments

and the investigation of new processes and improvements. The association also defrays the cost of the publication of an annual ("Jernkontorets Ånaler"), which gives an account of the progress and improvements in the iron industry. It has been issued regularly since 1817. The association meets every third year in Stockholm to discuss business matters and technical questions. The management is in the hands of five ordinary and five extra administrators, elected at these meetings. The association now has a fund of \$1,366,266, which has accrued from the annual contributions of the members. Its income in 1891 was \$68,304, and expenditures were \$67,148. Americans will be interested in the statement, under the head of machinery, that a good number of the machine tools used in the workshops of Sweden are of American origin. Much attention is given in Sweden to the hygiene of the workshop and factory.

### The New York Belting & Packing Company

of New York, whose branch offices are located in all the leading cities of the country and have even been established abroad, have a magnificent exhibit of their specialties at Column J 27, Machinery Hall. A characteristic pavilion has been erected for the purpose. The posts of this structure are pieces of large rubber hose, with metal bands round them to which the supports of the roof and the railings are attached. The railings are a combination of rubber work, such as hose and bicycle pedals, the latter being arranged to form lattice work. Entrances are archways of rubber hose. Festoons of rubber hose are hung under the muslin canopy forming the roof. Inside the pavilion are placed in orderly groups an immense number of specimens of the varied products turned out by this company. There are columns made of belts of different widths, from 60 inches down. Other columns are composed of emery wheels. Rubber hose of many sizes is shown, including mammoth hose for high pressures. Rubber mats and pressed goods are displayed in great variety. Prominent in the display are bicycle goods, much attention being given to pneumatic tires. Samples are shown of such tires with which famous bicycle races were won. Included among the exhibits are specimens of pure rubber, shown just as they are received from the rubber-producing districts of South America.

### The Ferris Wheel Profitable.

The great Ferris wheel has justified the faith of its designer and those who backed him with their means. It has paid the cost of its construction and will now yield dividends to its owners. When the concession for the wheel was granted the Ferris Wheel Company were permitted to take in \$300,000 before they began paying any percentage to the Exposition Company. This mark was passed September 8, with \$3000 to spare. Hereafter 50 per cent. of the receipts will be turned over to the Exposition Company. The daily average business for the wheel has increased gradually until the receipts on the 8th were \$8000.

### The Capitol Mfg. Co.

of Chicago make a fine exhibit of bolt-cutting and nut-tapping machines at column L 41, Machinery Hall. These consist of a Cook automatic nut-tapping machine, two double-head and three single head bolt cutters, and a

machine for threading and cutting off small pipe. The nut tapper is exhibited at work on  $\frac{1}{4}$ -inch nuts, needing no attention from the operator except to fill its hopper with blanks, and turning out completed work with marvelous celerity. The bolt cutters shown cover a range of work from  $\frac{3}{8}$  to  $3\frac{1}{2}$  inches, all making the thread with a single cut. The pipe threader is new. It will cut and thread pipe up to  $2\frac{1}{2}$  inches. The pipe dies are inserted in an Adams head of the kind used on the bolt cutters. Another head has a two-jaw universal chuck. Between these heads is a movable carriage having jaws to hold the pipe, which can be passed entirely through the machine, as the spindles of both heads are hollow. The spindles are operated by independent clutches.

### Test of Holtzer Projectiles.

At the United States Government proving grounds, Sandy Hook, on September 5, most successful tests were made of the 300-pound Holtzer projectile, manufactured in America. The projectile was fired from an 8-inch rifled gun, with 100-pound charge of hexagonal powder, the result being the penetration of the steel plate target—a large plate of open-hearth steel, oil tempered and of the thickness of 9 inches—of 8 feet of oak backing, and 20 feet of packed sand behind the target. When dug out the projectile showed neither dent, flaw nor scratch. Its point was intact, and delicate measurement demonstrated that the "upset" was only 0.005 inch. The loss of the other Holtzer projectile fired during the same tests prevented comparisons, although that, too, pierced the plate and backing, making a clean hole. The initial velocity of each shot was about the same—1624 feet per second, and the pressure 23,260 pounds. The tests were the outcome of an advertisement published by the War Department two years ago for the best armor-piercing projectiles. Holtzer & Co. of Unieux, France, control a secret process invented by C. E. Brustlein for the hardening of steel. The process has been purchased by the Midvale Steel Company, Nicetown, Pa., together with the right of manufacture for the American continent, and it is that company who supplied the projectiles tested last week. A large plant for their manufacture has been erected at the Nicetown works under the personal supervision of M. Brustlein, the inventor. A contract was entered into with the Government for the supply of 73 projectiles, subject to success in the tests, which is now assured. Further lots will, it is said, be manufactured under similar conditions.

An international agreement with Canada was signed on Saturday which provides for the control of immigration through Canada to the United States. It is arranged that immigrants landed at Halifax, Quebec, Point Levis and Vancouver shall be subjected to inspection by United States Inspectors stationed at those ports of entry.

Further advices from the South show the effects of the late cyclone on the Atlantic Coast to have been much more fatal than it was at first supposed. The loss of life among negroes of the Sea Islands and the coast is now placed as high as 1500 persons, while about 100,000 have, it is said, been rendered homeless and destitute.

### The Billings & Spencer Drop Hammer.

The Billings & Spencer Company of Hartford, Conn., have an exhibit at Column K 5, in Machinery Hall, World's Fair, occupying considerable space. Prominent in their exhibit is a large display board in pyramidal shape on which are shown a very great variety of drop forgings in iron, steel, copper, bronze and aluminum surmounted by a very large model of a wrench. The company are pioneers in drop forgings,

are belt stretchers for drawing the ends of belts together to fasten them while they remain on the pulleys; Billings' new patent beam caliper, made with and without a micrometer attachment, the design of which is to produce a caliper square possessing the minimum of weight with the maximum of stiffness and durability; the new Spencer nail puller, which is so constructed that it will pull nails perfectly straight, having a range from a tack to a 20-penny nail, and with no springs to get out of order; the new Billings wire cutter, which has four cutting edges on the

eliminating weak points and adding desirable features until they have fully satisfied their own exacting requirements. All parts of these hammers—the principal points of one of which are clearly shown in the accompanying drawings—are made especially strong to withstand the great strain and jar to which such machines are subjected.

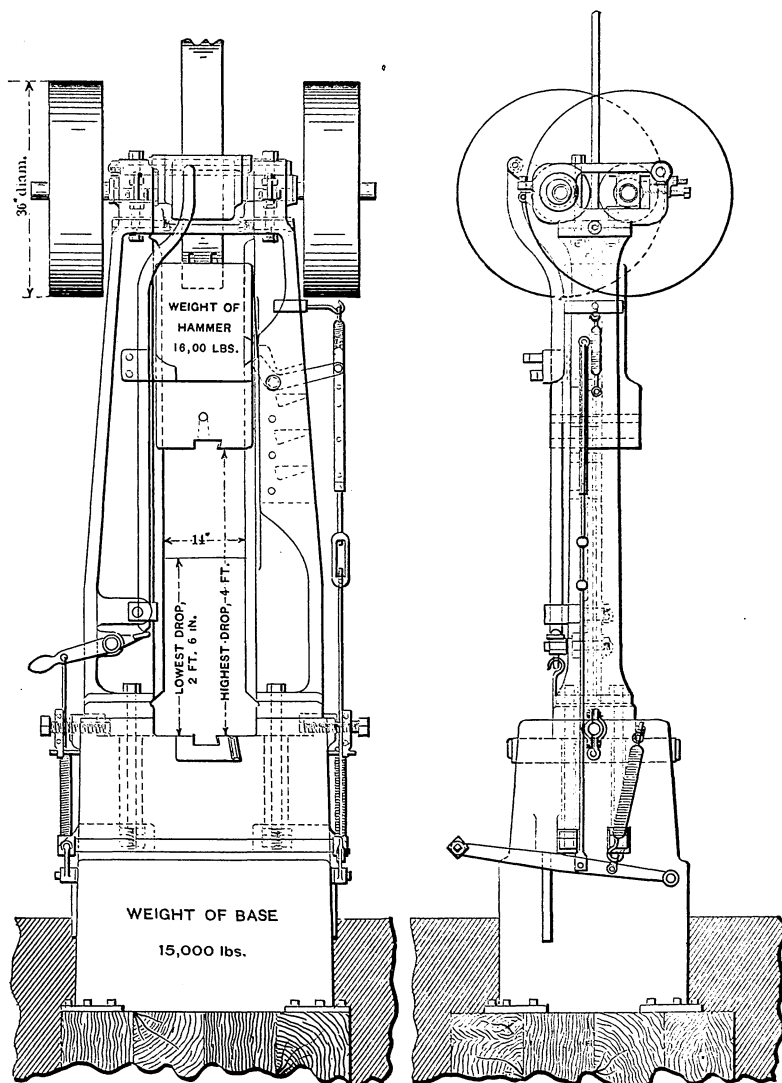
The greatest item of expense in a drop shop is the keeping of the machinery in repair, and the part of a drop hammer that oftenest needs repairing is the head or overhead running gear. Ordinarily, when anything happens to that part of the machine it is necessary to remove the entire head, which may weigh from 1000 to 4000 pounds, get it down on to the ground and take it all apart to get at the broken part. This is expensive, as it requires a good deal of muscle and time. To overcome this annoyance and expense the new head for these hammers has a hinge arrangement by which any part of the head can be gotten at or removed without taking down the entire head. The range of these hammers is from 300 to 2000 pounds.

The company also have an exhibit at Section R-7 a, in Electrical Building, where they display specimens of copper and bronze drop forgings for electrical work. These are arranged on a large display board, surmounted with a huge model of a commutator bar.

### The New Navy Rifle.

Secretary Herbert, in approving the recommendation of the Chief of the Ordnance Bureau, founded on the report of the Newport Board of Experts, has fixed upon a caliber of .234 for the new magazine rifle for the navy. This is over one-fifth less than that of the new army rifle, and it is an altogether new departure in small-bore arms, being the smallest caliber yet adopted in any service in the world. The French Lebel rifle has .315. The Austrian Mannlicher, which is found also in Bulgaria, Chili and Siam, has also .315. The Belgian Mauser, adopted also elsewhere, as in Argentina, has .301. The English Lee-Speed has .303. The German Mannlicher has .311. The Portuguese Guedes has .315. The Danish Krag-Jørgensen has .315, and our army model on that system has .30. The new Russian rifle is also .30. The Swedish single loader Remington is .315. The Swiss Schmidt is .295. The newer of the Italian rifles is .256, which was a great drop below the Swiss Schmidt, while it is in turn now outdone by the caliber just decided upon for the United States navy.

While the question as to the magazine system which is to be adopted has not yet been finally decided upon, it was thought that whether the Krag-Jørgensen was selected, or some other, the .30 caliber of the rifle would be accepted, on account of the obvious advantages of an interchangeability of ammunition between the two services; but the board have based their recommendation upon what appear to them to be considerations of greater importance—namely, that the .234 bore will give greater velocity, range, penetration and accuracy, besides allowing the men to carry a greater amount of ammunition. Secretary Herbert will, it is reported, shortly call upon the makers of small arms to compete on the new caliber basis. The Department will, if necessary, furnish the barrels, so that inventors need only apply their breech mechanism to them. Another note-



Front Elevation.

Side Elevation.

THE BILLINGS & SPENCER DROP HAMMER.

having begun to make them in 1869. The forgings consist of bicycle parts, gun, pistol and sewing machine parts, eye bolts dropped from the solid bar without welding, connection rods, die stocks, lathe dogs and tools, such as machine wrenches, of which over 100 different styles and sizes are shown. The copper forgings are principally commutator bars for electric dynamos. The bronze forgings are also for electrical appliances, including the Government torpedo boat. The carriage pole crab is one of the most intricate forgings the company make. This is dropped from the solid steel in two operations, and is then bored out to receive the end of the wooden pole. Other specialties in the line of finished goods which are exhibited

rim besides two which are inclosed, will cut iron wire, tool steel wire, Stubb's rods, &c., and has an adjustable gauge attached by which wire can be cut into uniform lengths; the Billings bicycle wrench, combination pliers and machinists' ball pein hammers, which have a world-wide reputation; screw plates, hand taps, lathe dogs, and a very great array of ratchet drills, of which the company claim to make more and a greater variety than any other manufacturer; machinists' clamps, C clamps, threading tools, machine makers' screw drivers, surface and scratch gauges, hand vises, &c.

The company are now manufacturing improved drop hammers and trimming presses of their own design, which they have thoroughly tested in their shops,



worthy innovation in connection with the new navy rifle is that the barrels will be made of nickel-steel alloy.

### Iron and Steel at the World's Columbian Exposition—VI.

BY E. C. POTTER, CHICAGO.

The iron and steel industries of Austria are represented by two works. The Poldi Crucible Steel Works have an attractive exhibit in the Mining Building in the shape of a very unique and artistic pavilion constructed wholly of crucible steel and containing ingots and bars, springs, stands of scythe blades, round shot, &c. A central glass case contains fractures and test pieces.

The cast steel works of E. Skolda, Pilsen, Bohemia, exhibit in Machinery Building some very large steel castings, among which are a complete screw propeller weighing 8 tons, some large beveled gears, V-toothed gears, locomotive drive wheel centers and helical rolling-mill pinions. An important branch of this firm's business is the manufacture of rapid-fire machine guns, system Skolda.

Italy is represented by the display of Vanzetti, Sagramosa & Co. of Milan, who exhibit the products of their iron and steel foundry in the shape of miscellaneous castings and photographs of some of their more ambitious achievements, such as stem posts, stern posts and rudder frames for steamships, propeller shaft brackets, &c.

The Sociedad de Altos Hornos is the sole representative of the iron industry of Spain. This company have an extensive works in the famous iron ore district of Bilbao. Their works include three blast furnaces, a modern Bessemer works, an open-hearth furnace of 12 tons capacity, rolling mills for rails, shapes and plates, a foundry and a shipyard. The products of the plant include pig iron, merchant bar, rails and splices, shapes, ship and boiler plates and castings, all of which are well represented in their exhibit, together with samples of Bilbao ore.

The works of La Encarnacion, Zima, Mexico, have a rack in the Mexican mineral display showing the various sizes and shapes of bar iron which they manufacture.

The great industry of England is represented by four works. While this seems a meager representation, yet the works exhibiting are the best in their special field and their displays very satisfactory, thus atoning to some extent for the apparent lack of interest shown by the trade in general. The first of these works, that of John Brown & Co., Ltd., Sheffield, proprietors of the well-known Atlas Works, have their exhibit in the Transportation Building, as it is devoted almost wholly to equipment for shipping. It includes several pieces of armor plate, a section of a propeller crank shaft, a propeller blade, and a hydraulic flanged boiler front with three Purves' cylindrical steel ribbed furnaces.

The famous Low Moor works have a small, though very complete and interesting exhibit in the Mining Building. Low Moor iron has long been a standard for excellence, and the articles shown well illustrate their right to their reputation. Prominent among them are an English locomotive crank axle guaranteed to run 100,000 miles; an American locomotive driving axle and a standard car axle, each guaranteed for

150,000 miles; locomotive crank pins, boiler heads and steam domes; all sizes bar iron, chains and rivets, many of them bent and distorted cold; two locomotive piston rods that have been in service on an American railway for the past five and a half years without appreciable wear, and which are good for many more years' service. One of them has been purposely bent, showing that it maintains its pristine tenacity with no evidences of crystallization. A beautiful example of the remarkable ductility of this material is a bundle of wire of No. 42 gauge, 9 miles long, drawn down from Low Moor rod. There are also samples of Low Moor cold blast pig iron and specimens of ironstone and coal. These, together with photographic views of the works, complete a very creditable display.

The name of Wm. Jessop & Sons, Limited, of Sheffield is well known to users of tool steel both in America and England, and their exhibit of crucible steel in the Mining Building is a most attractive one. There are shown all sizes of round and octagonal bars, saws and saw blanks, sheets from which pens are cut, and tool blanks. In the way of crucible steel castings are gears, several of them of considerable size, a helical pinion for a 10 inch roll train, and numerous smaller articles. Photographs are shown of some of their larger work, including a cast-steel stern post and single plate rudder frame for a steamship, the stern post weighing 15 tons and the rudder 8½ tons; also a complete triple crank shaft for a screw propeller. Glass cases contain numerous fractured sections of steel.

The Sanderson Bros. Steel Company, Limited, of Sheffield exhibit various sizes and shapes of tool steel.

The Cambria Iron Works of Johnstown, Pa., are to be credited with the largest and most complete display of any of the American iron and steel works. They occupy a large space and the exhibits are very comprehensive in extent and handsomely disposed. Three large steel ingots of rail steel, soft Bessemer steel and open-hearth steel respectively are fractured to show the grain. Superimposed are fractured blooms, billets and bars, showing the effect of successive reductions. Adjoining are cases containing pieces of merchant bar in round and square sections from ½ to 6 inches diameter. A case containing sections of steel rails is historically interesting, as among them are many obsolete sections of the early days of railroading, forming a sharp contrast to the better designs of to-day. In the same case are many sections of strap and girder tram rails. Still another case holds a large line of channel and angle sections. A number of locomotive and car axles and locomotive crank pins are shown. A large share of the space is given to the Cambria special steels, in the shape of tool-steel bars, spring-steel plowshares and cultivator blades, cold-rolled steel and wire fencing. A large rack contains on one side full-length steel rails from 8 to 75 pounds per yard; on the other side channel bars from 6 to 12 inches in depth. Samples of dephosphorized pig by the Krupp washing process and all grades of spiegel and ferromanganese are shown. A valuable relic of by-gone days is the old Kelley experimental converter, the germ from which the present great industry with its gigantic plants has grown. The Cambria exhibit is a most creditable one, and one can only wish that there were more like it over which the Stars and Stripes might wave.

Adjoining the Cambria exhibit is that of the Solid Steel Casting Company of Alliance, Ohio. This display, consisting wholly of steel castings, is a most remarkable one, rivaling anything at the fair in the same line, not even excepting Krupp. The latter, it is true, shows larger pieces, but the execution is no better. To detail the very large list of articles displayed would fill a small book; prominent among them are: A gun lathe face plate for the United States Government, which, as near as one could judge, is about 7 or 8 feet diameter (the criticism to be made on the display is that the dimensions or weight of none of the articles are given); a vertical engine frame; two triple crank shafts about 6 inches diameter; a helical pinion for a 16 inch roll train; a heavy anchor fluke; numerous vertical plane couplers; a dredge bucket; a winding drum with worm gears. There are also numerous tests shown. Several of the castings are forged out into tools—a sickle, a trowel, a hatchet and the like—showing the high quality of the material. A very interesting thing is a hollow ingot on the interior of which large crystals of steel have been developed by slow cooling.

The exhibit of the Crescent Steel Company of Pittsburgh adjoins the foregoing. They are one of the largest and best known makers of crucible steel and tool steel in this country, and their exhibit is a fine one. It includes crucible steel bars, a 12-inch hammered steel roll, a 6 inch round hammered steel bar, sections of rolled shapes and pieces of drill rods, an almost unending variety of tools such as drills, taps and dies, shaped and engraved dies, auger bits, watchmakers' tools, watch parts, cutters, reamers, cut gears, band saws, &c. An interesting feature of the exhibit is the large number of tools and implements made from Crescent steel which have seen long and remarkable service, the most remarkable of which perhaps is a piston rod which has worked steadily for eight years nine months eight hours per day, averaging 285 days per year, and in that time has traveled within the narrow limits of its cylinder a total distance of 35,795 miles!

Singer, Nimick & Co. of Pittsburgh, another well known firm in the manufacture of crucible steel, have an extensive display adjoining the foregoing. It embraces various sizes of crucible-steel bars, square, round and octagon tool steel, circular and band saw blanks, a fluid compressed steel ingot, numerous sheet-steel vessels and shapes drawn by the Avery Stamping Company; carriage axles, plowshare and cultivator blanks, coil and elliptic springs, light planished steel sheets. A glass case contains a great number of tools and other commodities made from their steel, such as sewing-machine parts, files, skates, &c.

The W. Dewees Wood Company of McKeesport, Pa., have a strikingly arranged exhibit of planished and Russia sheet iron, stove pipe, stove jackets and the like. All the locomotives in the American section of the Transportation Building are said to be jacketed with this material.

The Pottstown Iron Works of Pottstown, Pa., exhibit basic steel billets and slabs, steel boiler plate and flanged boiler heads, tank plate and steel wire nails. Under the east gallery is hung a universal mill plate rolled by this company 7/8 inch thick, 20 inches wide and 150 feet long. This exhibit is especially interesting as being the only

exhibit of American basic steel at the fair.

The Chrome Steel works of Brooklyn, N. Y., have an exhibit of their specialties, which include stamp mill shoes and dies, tappets and cams, crusher plates for rock crushers, and burglar-proof safe plates. The latter are five ply, consisting of three sheets of iron plates with two sheets of chrome steel alternately interposed.

Our newest infant industry, the manufacture of tin plate, is extensively exhibited in the South Gallery of the Mining Building by the American Society of Tin Plate Manufacturers, including the following works:

American Tin Plate Company, Elwood, Ind.  
Cleveland Tin Plate Company Cleveland, Ohio.  
Columbia Tin Plate Company, Piqua, Ohio.  
United States Iron and Tin Plate Company, Demmler, Pa.  
Penn Treaty Iron Works, Marshall Bros., Philadelphia.  
Phillips Tin Plate Company, Philadelphia.  
Wallace, Banfield & Company, Irondale, Ohio.  
St. Louis Stamping Company, St. Louis, Mo.

Each works display their particular make of various sizes of tin andterne plates, and there is besides an educational exhibit showing the various materials and processes entering into the manufacture of the article. These include iron ore, coke, limestone, pig iron, tin ore, pig tin, steel slabs, tin bars, black sheets before and after pack rolling, sheared and rough and pickled. The whole is housed under a unique pavilion made of tin plate.

The exhibit of the metallurgy of iron and steel in the southwest gallery of the Mining Building strikes one as being rather inadequate to the subject. The various processes are illustrated, but hardly in a way to impress one with the magnitude of the industry or its marvelous development. Blast furnace practice is illustrated by drawings of the general plan of the North Chicago Rolling Mill Company's furnace plant at South Chicago, drawing and model of a Gordon-Whitwell hot-blast stove, model of the original type of the Whitwell stove, sectional drawings of the Edgar Thomson furnaces and some English furnaces; samples of iron ore, coke, pig iron and slag, drawings of a Player iron pipe hot-blast stove, a Gjers calcining kiln, a modern 16 x 70 feet furnace and horizontal blowing engine by the Philadelphia Engineering Works. The puddling and refining processes are illustrated by drawings of a reverberatory furnace, a Danks furnace, a Lancashire hearth and a cementation furnace, with samples of raw materials and products. The steel-making processes are illustrated by drawings of a crucible melting furnace, a Siemens-Martin furnace and gas producer, and a Bessemer converter with ladle and crane, together with products and processes. A case containing some old and rare works on the metallurgy of iron is the most interesting feature of this display.

Leaving the Mining Building, we find another batch of iron and steel exhibits in the Machinery Palace. The first one to attract the attention, being close to the main northern entrance, is that of the extensive works of the Providence Iron & Steel Works Company of Marchienne-au Pont, Belgium. This large concern possess six ore mines in Lux-

embourg and in France; their works include 7 blast furnaces, a Siemens-Martin steel works, a basic steel works, 96 puddling furnaces, 48 reheating furnaces, 23 trains of rolls, 2 foundries, 2 machine shops, and 2 copper-smith shops. The mines turn out yearly between 600,000 and 700,000 tons of ore, of which 500,000 tons are used in the works, the balance being marketed. The production of the works last year was 172,000 tons pig iron, 80,000 tons finished material and 4200 tons castings. The total business of the company amounts to about \$4,000,000 annually. Four thousand workmen are employed, beside the men at the mines. The products of the works, which are exemplified in its exhibit, embrace all kinds of pig iron and spiegel, all sizes merchant bar up to 7½ inches diameter, girders up to 20 inches deep and 130 feet long, channels up to 12 inches deep and 130 feet long, all sizes angles and tees, quadrant pillar sections, longitudinal and transverse railway sleepers, riveted girders and bridge iron, plates and sheets of any size, corrugated sheets, center plate wheels for railway cars, cast-iron columns and other castings for structures. The exhibit is an attractive one, the many sections being handsomely mounted, and bespeaks the importance of the works they represent.

The works of Fernand Thiébaud of the same place, as well as those of the Société Anonyme de Dampremy-Olloy, Dampremy, Belgium, are devoted to the manufacture of wire rods and wire, which is shown in all sizes.

The Société Anonyme des Usines du Phenix, Chatelineau, Belgium, manufacture boiler plate, having on exhibition several examples of plate and boiler heads, the largest plate being 7½ feet wide and 33 feet long.

The works of Valère Mabilie, Mariemont, Belgium, make a specialty of girders, both rolled and riveted, having capacity to roll the former up to 21 inches deep and weighing 168 pounds per foot. In addition to these they make couplers, buffers, hooks and chains for railway carriage couplings, coiled and elliptic springs, and all sizes of rail sections.

The great works of Schneider & Co., Creusot, France, have a most interesting display, commensurate with the size and importance of this, the largest establishment in France. A prominent feature of their display is the material of war which they manufacture extensively. This consists of a model of a nickel steel armor plate, the original of which was sent to this country for test at Annapolis in September, 1890; two plates for screens for rapid-fire guns; a quick-firing gun, carriage and caisson; a quick-firing field howitzer and caisson; a torpedo-launching tube; a quick-firing 50-caliber gun and shield; full-size model of turret and mounting for 2½ inch quick-firing gun; small models of turrets for 6-inch, 9½-inch and 12-inch guns, the latter with hydraulic carriage. Their machinery construction department is represented by working models of three engines for French war vessels; a model of a large air compressor for mine; a 150 horsepower engine; a dynamo of 50,000 watts capacity. The department of civil engineering construction is represented by a scale model of the Malleco viaduct in Chili, length 1138 feet, in five spans, and a scale model of the bridge over the Borcea, Roumania, length 1371 feet, in three spans. The iron and steel departments are represented by sections of almost every conceivable shape and size of rails, tires,

structural shapes and bars up to 6 inches square and rounds 9 inches diameter. There are numerous examples of drawn sheet steel in various shapes. The examples of tests are very fine, embracing two flat bars of mild steel 8 inches wide, 1½ inches thick, broken by tensile strain—strength and reduction of area not given; a piece of mild round steel 8 inches diameter, bent double cold; a steel armor plate bolt 4 inches diameter broken by tension; a duplicate of the same bent double cold; an iron railway axle bent double cold and the journals bent to a right angle at the shoulder; two steel bars 6 inches square bent double cold; fractures of round iron bars 5 inches, 7 inches and 9 inches in diameter respectively; fractures of various thicknesses of armor plate from 3 inches up to 12 inches, showing grain of that tempered and that not tempered; fracture of a 4 inch square nickel steel bar. A cylinder head for the low-pressure cylinder of the engine of the steamship "La Touraine" weighing 9700 pounds is an example of what can be done at these works in the way of steel castings. Numerous drawings and views of the works and mines of the company complete the display of the largest works in France and one of the largest in the world. No works in America undertake so large a variety of manufacture and construction as is accomplished at Creusot, and to the initiated this display conveys a sense of vastness and withal excellence of workmanship that fills one with admiration and respect.

#### The French Engineers in Chicago.

The delegation of some 40 members of the Society of French Civil Engineers, now visiting this country, arrived in Chicago on the 10th inst. They were warmly received by representatives of American engineering societies. A formal welcome was given them on Monday at 10 Van Buren street, the headquarters of the Associated Engineering Societies of the United States and Canada. The address on this occasion was delivered by O. Chanute, president of the associated societies. The visitors were then taken in charge by a Committee on Arrangements, consisting of R. W. Hunt, Isham Randolph, Hosea Webster, John Lundie, J. F. Wallace, Charles Fitz-Simons and W. J. Cosgrain, who had prepared an elaborate programme for their entertainment during the week. Secretary Max E. Schmidt furnished them with a programme for the week printed in French, which was appreciated. During the week the principal object of interest was the World's Fair, and every effort was made to give the party the best facilities to observe the features of most interest from an engineering standpoint. The city itself was not neglected, however, and some time was spent in inspecting its characteristic points.

They passed Saturday, Sunday and Monday in visiting the fair and inspecting engineering matters about the city. Monday evening they were banqueted at the Union League Club by the Western Society of Engineers, whose guests they had been during their entire stay in Chicago. Tuesday they left for St. Louis, where they will make a short stay, and then go East to Pittsburgh and Philadelphia.

The Directors of the Manchester Ship Canal announce that it will be open for traffic early in next year.



## THE WEEK.

The very dry weather has caused disastrous forest fires in many parts of the country. Northern Wisconsin appears to have suffered most severely from this cause. Last week all Northern Wisconsin was one smoldering furnace, millions of dollars' worth of property having been destroyed. Great tracts of valuable timber land have been laid waste and towns have been wiped out of existence. Traffic on the Wisconsin Central Railroad was suspended owing to burned bridges. Rain only will check further and perhaps more serious damage.

Following the lead of their English fellow-workers, the coal miners of the Pas de Calais, in France, have struck for increased wages. The strike, if long extended, is likely to cause much embarrassment to the manufacturing industries of Northern France.

It is stated that British army officers lately visited Hartford, Conn., to inspect the Spourel rapid-firing guns made by the Pratt & Whitney Company.

The receivers of the Northern Pacific railroad reported on Monday to the United States Court in Milwaukee, recommending the canceling of the Wisconsin Central lease.

It is estimated by the Canadian authorities that at least 100,000 pounds of opium, refined in British Columbia, are annually smuggled into the United States.

At the annual meeting of the New York Board of Steam Navigation, held last week, President Churchman recommended that the Government should offer suitable pay to the merchant marine for destroying or bringing in derelict vessels.

Since 1867 there have been exported from Cape Colony, South Africa, 50,000,000 carats of diamonds valued at about \$350,000,000.

The Coopers' National Convention in session at Milwaukee adopted resolutions protesting against the competition of convict labor, especially in the States of Illinois, Indiana and Michigan.

An indication of the possibility of reorganization of the Panama Canal Company and resumption of its work is seen in the announcement that on August 31 the first installment of 500,000 francs was paid by the Canal Company to the Colombian Government under its new contract.

M. Boutan, a French scientist, who is also a practical diver, has succeeded in taking photographs of his surroundings when standing on the bed of the Mediterranean Sea at Banyuls-Sur-Mer, near the frontier of France and Spain.

The Oregon Pacific Railroad Company will, it is stated, put on two steamships of 2000 tons capacity to ply between Yaquina Bay, Ore., and Honolulu.

At the inauguration of the new steamship services between Newport News and England on September 8, President M. E. Ingalls of the Chesapeake & Ohio Railroad, in the course of a speech at the banquet given at Newport News to the company's guests, referred to the opening of the line as a notable event in the commercial history of the country. The meats and grain and cotton and tobacco of the Ohio and Mississippi

valleys, he observed, can now be carried out through the port of Newport News and by the new steamship line to all parts of Europe cheaper and quicker than through any other port on the continent. The opening of this line of steamships marks a new era in the commerce of this country. The merchant of Cincinnati, St. Louis and Chicago can to-day have his through bill of lading for goods for London and Liverpool given him direct by this line, and he can make his importations through this port. The first steamship of the line—the "Rappahannock"—sailed for Liverpool last week, and the six vessels belonging to the company will keep up a weekly service. The steamers are 370 feet in length and 44 feet in breadth, with a cargo capacity of 6000 tons, and contain fittings for 770 head of cattle.

Plans have been prepared and arrangements perfected for the construction of the proposed electric railroad between Washington and Baltimore.

Orange, N. J., enjoys the rather unique distinction of possessing a large force of workmen who have been farseeing enough to request a reduction of wages. These are the men employed by the Suburban Traction Company, whose business has been greatly curtailed since the closing down of the Orange hat factories. Knowing that the line was being operated at a loss, the men a few days ago, in a communication addressed to the president of the company, offered to work for reduced wages until better times. Their offer was frankly accepted.

The desirability of establishing coaling stations for the navy abroad is again being taken into consideration by the Government. It is announced that efforts will be made by the new United States Minister to Hayti to acquire Mole St. Nicholas for the purpose, and the purchase of one of the Galapagos Islands from Ecuador is suggested. The cessions of coaling facilities at Samoa and Pearl River, in the Hawaiian Islands, which have long been expected, will probably now be pushed to an issue.

A striking illustration of the present scarcity of investing funds was shown last week when Jersey City offered for sale \$700,000 worth of 5 per cent. bonds and received only one bid, and that for but \$10,000 at par. The bonds of the city have always sold above par for more than 20 years.

The new gunboat "Castine" has undergone her trial speed test at Bath, Maine, and has been found to far exceed the requirements of her contract, which demanded 14 knots per hour. The vessel actually accomplished a speed of 16.4 knots.

The Spanish Government has issued the prospectus of a Universal Exhibition to be held at Madrid from April 1 to October 31, 1894. All communications should be addressed to the secretary, Palacia de la Industriay de las Artes, Madrid.

The promising seaport of Newport News, Va., has added another to the list of its recommendations in the inauguration of the Chesapeake & Ohio Steamship Company, a new line of steamers to ply between that place and Liverpool, London, Glasgow and other European seaports. The line, which is virtually owned by the Chesapeake and Ohio Railroad Corporation, was formally opened on September 9, when a large party of Western business men

and exporters were taken to Newport News as visitors of the company, in order to participate in the starting. This line opens up a direct through shipping route between St. Louis and Chicago and the Atlantic, and it is expected to largely stimulate the foreign trade of those cities, practically giving to the West an Eastern port of their own. It has been arranged to issue through bills of lading between the Western cities and the European ports, and handle the freight direct from the cars to the ship and *vice versa*.

It appears that numbers of the Columbian souvenir half dollars are drifting back into the Treasury after having been disbursed at their denominational rate. Large quantities of the coins remain undisposed of, and it is evident that the issue was too large.

One hundred and thirty plans for the new City Hall have been received by the New York Municipal Buildings Commission, from architects in all parts of the country. Three leading American architects have been named as an advisory committee to examine the plans and assist the commission in arriving at a decision. Six plans are to be selected for the final competition. The author of one of these will be awarded the order for constructing the new building. Its architect will get 5 per cent. of the first million expended, 4 per cent. of the second million, and 3 per cent. of all other sums. The architects of the remaining five best plans will get \$2000 each.

The "Lucania," the newest Cunarder, broke all maiden records on her recent trip from Queenstown to Sandy Hook. She promises to eclipse her sister ship, the "Campania," when she gets down to business, for record-breaking.

An important discovery of quicksilver, said to be the first lode ever struck in the Southern hemisphere, has been made recently at Ohaeawet, Bay of Islands, New Zealand. There is said to be a large quantity of ore in sight.

What is believed to have been the largest sale of cotton goods on record was carried out in New York last Thursday, when \$1,500,000 worth of fabrics from the Amoskeag Mills were put up to auction and were purchased by some of the leading dry goods houses of the country.

Rio de Janeiro was bombarded by the rebel Brazilian fleet under Admiral Mello, on Wednesday, the 13th. President Peixotto controls the telegraph lines and has restricted the transmission of messages, consequently only meager details of the situation have been received. The news caused considerable excitement on the New York Coffee Exchange.

Interesting statistics in regard to the petroleum industry of Pennsylvania are given in the recent report of Albert Bolles, Chief of the Department of Internal Affairs. The total capital invested in the oil industry of the State including vessels and pipe lines is given as \$300,000,000. Pipe lines aggregating 25,000 miles have been laid and 59 tank steamers are now employed in conveying the oil abroad. The advance in cheapness of petroleum has been extraordinary. In 1861 a gallon of oil in bulk cost not less than 58 cents, and in 1892 the price was not more than 3½ cents. It is stated as a fact that a larger percentage of oil product is now shipped abroad than that of any other product except cotton.

# The Iron Age

New York, Thursday, September 21, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - EDITOR.  
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - HARDWARE EDITOR.  
JOHN S. KING, - - BUSINESS MANAGER.

## The Decline of the Amalgamated Association.

It is a little more than a year since we pointed out what strength the uprising against the Amalgamated Association of Iron and Steel Workers had attained. It is fair to state that to some extent the decline in the power of that labor organization has been brought about by changed conditions in the metallurgy of iron and in the plants themselves. The most potent factor has been the substitution of steel for iron, which has brought about a largely increased tonnage and has shorn the belligerent puddler of much of his power. Another fact which has been instrumental in disorganizing the association has been the circumstance that different plants possess more individuality, if it may be so termed. Formerly a large iron rolling mill depended upon its size for a multiplication of appliances similar in character and in product to that of its smaller rivals. Now nearly every steel works possesses handling machinery representing a different stage in the progress of the art. They cannot be placed on the same terms, and the result has been that every works of consequence has, or is entitled to, its own special scale.

The leaders of the Amalgamated Association may have read correctly the signs of the times, but the body of the men certainly have not. They have attempted to stem the tide of progress, and are now being swept along by it. They have attempted to exact extra prices for rolling soft steel, when in the nature of things a lower range would have been equitable. They have refused to recognize the evident drift of prices to a lower level, and have declined to so modify sliding scales that they would fairly represent existing conditions, and not a state of affairs which is past beyond any hope of return.

One by one important concerns have broken away from the control of the union, and the disintegration, which was gradual until this year, has proceeded at a greatly accelerated rate since the usual negotiations in June. In the face of a much depressed market, the members of the Amalgamated Association declined to make reasonable concessions, and when they did begin to weaken they attempted to gain their point by making special and practically exclusive terms with some of the leading manufacturers. Since then the industry suffered from the financial panic, and now that the leaders have

tardily acknowledged their mistake, the men themselves rush to destruction by refusing a concession which would have been accepted in July. Then the Western mills would have started on a 10 per cent. reduction in the finishing departments. Now the gap is even wider. The men voted last week against giving their Conference Committee authority to accept a 10 per cent. reduction. The manufacturers, on their part, now claim that the times have changed and that they must have a 20 per cent. cut in the wages scale.

In its long career of supremacy the Amalgamated Association has often abused its power by acts of petty annoyance which are far more galling than open warfare. With many mill committees the underlying motive seems to have been to trump up small grievances as frequently as possible. Their constant interference has done most to destroy that feeling which many manufacturers possess that they would rather deal with organized labor than with individuals.

We are far from believing that the last days of the Amalgamated Association of Iron and Steel Workers have come, but we do believe that that great labor organization will have to modify its methods very considerably if it hopes to recover and retain some part of the power which it once possessed.

## Machinery Sales at the World's Fair.

The commercial side of exhibiting at the World's Fair is one of the subjects usually and very properly kept in the background. If every exhibitor was to look for quick commercial results, and to undertake no display unless he was pretty thoroughly satisfied that he would be reimbursed his outlay by the time the show was over, there would perhaps never be a universal exposition worth looking at. The very people taking part would be makers of novelties of the catch-penny order, for which there is a good sale wherever crowds can be collected. Most exhibitors engage in an affair of this kind for the sake of the permanent results flowing from such an advertisement of their products, or to contribute to the glory of their country, of whose every achievement they are proud, or for the gratification of personal pride in showing to representatives of the world at large some triumph of ingenuity or of patient, persistent, indomitable application. And yet there is hardly an exhibitor who does not hope for some immediate return on the investment necessary to make an attractive exhibit. Even those who enter the lists from motives of patriotism and for personal glory are gratified to have their enterprise rewarded by substantial recognition. The inventor of the most ingenious piece of mechanism in the world may be flattered by the homage of the crowds that throng to see it, but such pleasure is as "tinkling cymbals and sounding brass" to the gratification

felt by the receipt of orders for the duplication of the device from practical people who appreciate its true value.

The World's Fair has thus far been a great success in attracting visitors, notwithstanding the stress of financial trouble throughout the country. There has also been a fair representation of foreign visitors, though by no means so large as had been expected. Exhibits have been quite thoroughly inspected by these visitors, who seem to have almost made it a religious duty to see everything in any way worth seeing. Registers kept by exhibitors of machinery generally are well filled, showing that they cannot complain that they have been altogether thrown in the shade by the numerous lighter attractions provided by the World's Fair managers. But when the question is asked as to the direct commercial result of the exhibits made, the answers returned show a wide variation. There are, for instance, some large makers of machinery very popular in certain trades who state that they have not taken an order for a single machine, although their exhibit is a good one, covering their entire line, and each machine can be shown in actual operation, doing its most perfect work as a matter of course, as it is run by an expert from the factory. Others report a few sales, but by no means what they expected when they looked forward to the World's Fair and heard the extravagant estimates made of the probable attendance. There are some, however, who are well pleased with what they have accomplished in booking orders and who will go home when the fair is ended well satisfied with the commercial results and ready to prepare for the next universal exposition with a great deal of enthusiasm.

The financial stringency is, of course, held primarily responsible for the lack of orders from visitors. Many exhibitors of standard machines report their callers making the remark very frequently that they "need just such a machine, but the times are now too hard and work is too slack to think of buying one." The manufacturers of machines somewhat out of the ordinary line, or making a decided improvement on the tools of the same character heretofore in use, have been more fortunate. Their orders may be affected to some extent by the unsettled financial conditions, but they are nevertheless doing very well, and find no fault with the business outcome of their World's Fair venture. If it were possible to get from all the American machinery exhibitors exact reports of the domestic and foreign orders entered, we believe the aggregate thus shown would be quite satisfactory and would be a conclusive argument in favor of making exhibits at such expositions. The fragmentary knowledge we have thus far been able to obtain covers sales made to almost every civilized country on the globe and to some that have thus far not been classified under this head in the geographies.

Something may be said in this connection with regard to the proper reception of visitors by exhibitors. Not every attendant in charge of an exhibit is by any means an ideal salesman of machinery. For many men who have been sent to the World's Fair to represent large interests look upon their function in this particular as one that can be easily discharged with very little actual labor or trouble. Some regard their appointment to such a responsible post as leave to take a holiday, and they are seldom found at the exhibit over which they are supposed to preside, but are "taking in the exposition." Others treat callers with indifference, exerting themselves but slightly in the effort to entertain and interest possible customers. The politeness of most people, especially foreigners, restrains them from entering an inclosed space unless they are specially invited to walk in. An exhibit of ingenious automatic machinery may mutely invite closer inspection, but an intervening railing which presents a barrier seems to warn the outsider to stay out, especially if there is a closed gate which some very acute railing maker has designed so that there is no visible way by which it can be opened. Unless an attendant is on the alert and personally invites a passer-by to enter who seems interested, he may miss many golden opportunities to secure customers. Machines do not sell themselves, and in these days of competing specialties there is hardly a piece of mechanism which does not have a competitor accomplishing the same purpose in a slightly different way. Hence, alertness and readiness to cultivate acquaintance with visitors are indispensable requisites for good and efficient attendants at exhibits. The most successful sellers of machinery at the exposition are men of this character. We recall one in particular who has made numerous foreign sales, who will even invite his visitors to get under a machine if they wish, so as to be able to see the feeds more thoroughly. He says his machines have been put on exhibition to be exhibited, and that he has greater success in making sales by appearing to conceal nothing than if he were to be in a chronic state of fear that foreign visitors were merely inspecting in order to steal American ideas.

#### Cinder-Mixed Iron in the East.

Consumers of pig iron in the territory east of the Allegheny Mountains and north of the Potomac will be forced to pay some attention to the question whether it will pay them to use pig iron for foundry purposes made from mixtures containing mill cinder. It is the natural outgrowth of a period of low prices that blast-furnace men take to replacing ore by cinder in order to cheapen their iron. It is claimed that at the present time an unusual number of producers are doing this and that they are indulging in an unfair

competition with works making an all-ore pig iron by offering an inferior article. Very few furnacemen are willing to acknowledge, when they are really doing it, that they are running on a part cinder mixture. There are some who deny it. We are inclined to believe that many iron producers themselves feel that they cannot make as good an article in this way. Many others hold that a moderate addition of cinder to the burden is far from being deleterious to the quality of the pig iron made.

There does exist a widespread conviction among producers, as well as among consumers, that all-ore pig is decidedly better than cinder mixed. It does not matter whether or not this is justified, it is reprehensible practice to sell the latter as the former, and consumers should be warned against such a deception.

But we do believe, on the other hand, that prevailing prejudice in this matter goes altogether too far. One maker's cinder-mixed iron may be very much better than another producer's. All are metal. Consumers should study the question on its merits, and in that work should have the frank and full co-operation of the makers. If the furnace can make cheaper iron in this way, the foundryman who can use it successfully is sure to get a part of the advantage of the lowering in cost, and deserves that advantage over his competitors. But all alike should discourage the maker who palms off what many, and often he himself, believe to be a lower grade metal for straight all-ore foundry iron. If cinder-mixed iron is as good for all uses, or is sufficiently good for certain purposes, let it conquer its position honestly and openly.

**The Hurd Mine Sold.**—The Mount Pleasant Mining Company have purchased from the Glendon Iron Company of Easton, Pa., the lease of the famous old New Jersey magnetite mine, the Hurd, at Hurdstown, N. J. The mine, which has a vein fluctuating in width from 20 to 60 feet, is now 4000 feet deep, the ore being guaranteed 66 per cent. of iron, while the maximum phosphorus contents is 0.10 per cent., the ore often going down to 0.08 and 0.09 per cent. For some time past the mine has not produced largely, but it is the purpose of the purchasers to carry the product up to 3000 or 5000 tons monthly. This they expect to accomplish by stripping the old mine and thus recovering the ore in pillars in the upper parts of the mine. The work will probably begin in about six months. The principal aim of the new owners will be to cater to the rolling-mill trade, the Hurd ore being particularly suitable for fix for puddling furnaces. With a freight rate of 60 to 75 cents per ton to the mills the Hurd fix ore is expected to secure a share of the market, which has been practically controlled by one of the leading Lake Champlain producers.

A gold medal of the value of 1000 Italian lire is offered to open competition by the Royal Academy of Science of the Institute of Bologna, Italy, for the best memoir describing a new and efficacious system for preventing or extinguishing fires.

## CORRESPONDENCE.

### Professor Reuleaux on Accuracy of Work.

*To the Editor:* A few days ago I had occasion to correct a notice which had appeared in the *Chicago Abendpost*, and in which our venerated Professor Reuleaux was made to say that American workmen were more exact in the execution of their work than their German colleagues.

In my communication to the *Abendpost* I stated that it had been my privilege to hold frequent conversations with Professor Reuleaux, during his visit to the World's Fair, in which we entered largely into the industrial conditions of Germany and America. During these conversations he frequently took occasion to express his pride in the achievements of our German industries, and also often praised the capabilities of German mechanics.

To one who knows so well how our German workmen are specially trained to their respective trades, it could certainly never occur to assert that American workmen can do more or are more intelligent than German workmen.

In Germany the cleverest workmen are still able to command the highest wages, whereas in America it often happens that a bad workman, who perhaps has not had any special training for his trade, is able to earn as much as even the cleverest workman, because the "union" demands it.

Moreover, a large percentage of American workmen are German, if not by birth, then certainly by extraction, and these are certainly not the worst workmen of America.

As the *Abendpost* pointed out that this question arose out of a notice brought by your esteemed paper, I at once referred to your back numbers and found that in your issue of August 10 you print a condensed report of a speech made by Professor Reuleaux on the last day of the Engineering Congress.

This report certainly does not give the exact meaning of Professor Reuleaux's impressions.

In his speech Professor Reuleaux simply alluded to some first-class instruments of precision that are exhibited in the World's Fair by some prominent American tool makers and which are conducive to exact work on the lathe and on other tool machines. He paid high tribute to those who had developed this branch of tool machinery and said that we were moving in the same direction in Germany. But he certainly never meant to convey the idea that German workmen were less able to turn out exact workmanship than American workmen.

You were therefore quite right in taking exception to such an opinion, and Professor Reuleaux, who has just returned from a trip to San Francisco, joins me in asking you to be kind enough to publish the above explanation so as to counteract the erroneous interpretations which have already found their way into our German papers and which have not been improved by translation.

Yours truly,

THEODORE VOSS, M.E.  
Representative of R. Wolf, Magdeburg-Buckan.

The steamship "Sommerostro" sailed from Bilbao for Matanzas, Cuba, last week, with a cargo of 2100 tons of steel rails. This is the first shipment of this material from the Biscay mills to the

Antilles. It is the outcome of the decree of April, 1892, which granted special privileges to certain Spanish industries. The steel rails for Matanzas were made by the high furnaces of Desierto, and their shipment to Cuba was the occasion of a grand festival at Bilbao.

## OBITUARY.

ALEXANDER K. RIDER.

Alexander K. Rider, inventor of the Rider hot-air pumping engine and the Rider cut-off engine, died on Thursday, September 14, at his home in Walden, Orange County, N. Y., from cancer in the stomach. Mr. Rider, who was in his 70th year, had been connected with the Delamater Iron Company since 1851. He was at first foreman of the foundry and afterward consulting engineer under John Ericsson, who was also connected with the concern. He was the inventor of several useful articles of machinery, but his greatest success was achieved in the production of the engines which bear his name.

FREDERICK L. AMES.

Frederick L. Ames of Boston, Mass., died suddenly on Tuesday, September 12, while taking passage in the Fall River Line steamer "Pilgrim" to New York. The cause of his death was apoplexy. Mr. Ames was probably the wealthiest man in New England, and was one of the railroad magnates of the country, being a director of about 70 railroad companies, as well as having a place on the board of almost every prominent trust company in Boston. He was born in 1835, the son of Oliver Ames of Easton, Mass. He graduated from Harvard in 1854, and became a clerk in the great Ames works at North Easton, where he was promoted grade by grade, according to the rules of the works. Very early he showed marked executive ability, and in 1863 he became a member of the firm of Oliver Ames & Sons. In 1876 the firm were reorganized as the Oliver Ames & Sons Corporation, with F. L. Ames as treasurer, a position which he actively filled until his death. When Mr. Ames' father died he became the possessor of \$5,000,000 or \$6,000,000. With this fortune he invested largely in railroad properties, and in these investments he was extraordinarily successful. His fortune is estimated at from \$25,000,000 to \$35,000,000. Mr. Ames was an ideal man of affairs, and took pains to master the details of all the various corporations in which he was interested. He was punctual and upright in all his dealings, and was just and considerate toward his subordinates, though considered somewhat cold and reserved in his manner. He married, in 1860, Rebecca Blair of St. Louis, and leaves three sons and two daughters.

SAMUEL J. SURDAM.

Samuel J. Surdam, senior member of the hardware firm of Surdam & Co., 178 Lake street, Chicago, died at his home in that city September 16. Mr. Surdam had been ill for some time and his death was not unexpected. Mr. Surdam was born near Troy, N. Y., in 1817. After receiving something of an education he married Miss Delia Frances Vanbalkenberg, and in 1840 moved to Chicago. His first business venture in that city was the opening of a hardware store on South Water street. In 1848 he purchased the ground and built a

four-story brick store at 178 Lake street, the site of the present hardware establishment. In the large fire of 1871 the store, as well as the family home, was destroyed. The loss was figured at \$100,000 at the time. Having once more gained a competence, Mr. Surdam gradually retired from active business, and for ten years A. Stelle, his son-in-law, has had charge of affairs at the Lake street store.

## Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., September 19, 1893.

Chairman Wilson of the Committee on Ways and Means, in a conversation concerning the plans of the Tariff Reform ring in the immediate future, said to-day:

"There is great pressure being brought to bear upon the committee just now to permit the tariff hearings to continue, but, speaking for myself, I think that is not necessary. The representative men under each of the branches of manufacture and tariff legislation, grouped under the several schedules, have stated their views. Of course these might be prolonged indefinitely as the subject economically is an endless one, and we know that the same may be said of it in difference of views in public debate and private opinion.

"The 20th, that is to-morrow, the day fixed by the majority of the committee, will end the hearings. It must be remembered that the original programme was not to give any hearings. The tariff conditions do not change so rapidly that opinions expressed before former committees within a few years go out of date. There is an immense mass of literature in the shape of reports and testimony which covers every phase of the question for and against an exclusively protective system, in possession of the Treasury Department and our committee. It was thought, however, by some of our friends on the committee that it would be more sagacious to give attention to the wishes of the men and interests concerned in maintaining existing statutory conditions. It could not then be charged that the present majority were coming any summary process over the manufacturers. Besides, the hearings which we have had supplemented the information in our possession and have indicated no change of position on the part of the manufacturers. They still insist upon protection as high as they can get. We think, that is I do and those who entertain the same views, that tariff rates can be brought down without detriment to the interests of our iron manufacturers and with benefit to the revenue which we now so much need. The Government has been running behind in receipts over disbursements for some months. There is an end to this sort of financial condition.

"The lowering of the duties not only produces revenue from imports, but it brings up a competition with our home manufactures. It lowers prices. Things will be cheaper, and we think our home industries can compete successfully with these imported articles.

"We think that improved mechanical appliances and the ready skill and alacrity of our American workmen more than compensate for the difference. Then free raw material will also aid in strengthening the ability of our home

manufacturers to compete with foreign goods.

"Yes, there will very likely be some equivalent reduction in the lower forms of manufacture to conform with the placing of raw materials on the free list, and the same ratio of percentage of reduction will be carried along throughout the whole system. It is not just under a revenue tariff to take all off a few articles and let the others remain undisturbed; each branch must bear its share.

"We are willing to take the responsibility of this radical change of policy in economic legislation. If it does not suit the great mass of the people they will very soon say so. They are the sources of power. The election results of last year were construed to mean that among other things the people demanded tariff legislation on the lines of the Chicago platform. If it did not mean that, what did it mean? Of course it might be said that candidates and the unity of party effort were the chief cause for the result. That may have been true, too, but public or party policies are not founded on such doctrines.

"It is the purpose, as far as I am concerned, and I think my colleagues on the committee are of the same opinion, that tariff reform shall be pushed forward on the lines of the party now in power.

"The question of labor in tariff adjustment is a very difficult one. Of course the manufacturers control that according to their own ideas. They can reduce wages on the plea that lower duties, foreign competition and lower prices for their manufactures demand such a course. If the workmen object the manufacturer must stop. This, of course, is a question which must be settled, and the quicker it is done the sooner our industrial life will adjust itself to the new conditions. If we are mistaken, as I have said, the remedy lies in the people. The wage workers of this country are a very formidable political element. They are also men of intelligence and self-reliance. They know what they want and they can discriminate as between their rights and impracticable demands. They can only get what belongs to them. The self-interest of the manufacturer is just as well guided.

"As I have said, this question has been a topic of public agitation in every biennial or quadrennial national election for years. Every one has complained of the ceaseless agitation and the cause of that disturbance of business serenity has been laid at our hands. Now we will give these views a fair trial and on the result throughout the country will depend the success or failure of our undertaking. The election succeeding the adoption of the present tariff act in 1890 we know was an overwhelming disapproval, and this was followed in the election of 1892. So let us see what will be the verdict on tariff reform in 1894. Whichever way it goes, I do not think the losing side will feel like stirring up any more agitation for a time."

The utterances of Mr. Carnegie as to the practicability of a lower scale of duties is giving the tariff reformers much ammunition.

The hearing of the tin-plate delegation and the representatives of the Amalgamated Iron and Steel Association completed the elaborate and staggering presentation of the interests of the iron and steel industries under the metal schedule of the Tariff bill. The tin-plate interests very clearly demonstrated that while the industry was rapidly



expanding, if it was revenue they wished, the Government is also deriving increased receipts from that source, the amount reaching about \$13,000,000 a year on the tin plate brought over to the United States, whereas, if all the plate produced in the United States had been imported in addition to the imported tin plate at the old rate, the duty would have aggregated less than one half.

The majority of the committee were often staggered by the harmony of manufacturers and labor in maintaining existing conditions. Chairman Wilson and colleagues insist that the hearings shall cease to-morrow.

They will then go on with the completion of their bill, which, they say, now can be ready for report in 30 days.

SEPTEMBER 20.—During the past 24 hours a great mass of petitions and remonstrances have been received by Chairman Wilson of the Ways and Means Committee from West Virginia, his own State, Alabama, Tennessee and Old Virginia, against closing the tariff hearings, which was fixed at the 20th.

The chairman and his Democratic colleagues still insist that they have heard all that they desire on the side of the manufacturers. They take the ground that if they extend the time longer the same influences will be brought to bear to keep open the agitation and protract the settlement of this question, which both sides agree should be disposed of at the earliest practicable moment.

The committee have agreed to receive any communications bearing on any of the questions before them, pending the compilation of the tariff reform bill now in their hands.

The Democratic members of the Committee on Ways and Means propose to begin on Thursday the holding of daily sessions for the purpose of expediting their work to the utmost. As soon as the bill is completed it will be submitted to the full committee.

Chairman Wilson has mapped out a line of action which will control the selection of the articles which are to be embraced in the proposed revision of the tariff.

## PERSONAL.

Johann Leman, professor at the Polytechnic School at Stuttgart, and formerly editor of *Dingler's Polytechnisches Journal*, is one of the recent visitors to this country.

G. Diechmann, from 1859 to 1883 chief engineer of the firm of Friedrich Krupp of Essen, and now a member of the board of the Gruson Works at Magdeburg, Germany, is now visiting this country. He is the representative in Germany and Austria of Tweddell's hydraulic tools.

F. B. Baird of the Buffalo Furnace Company is en route for the Mesaba range. On his return he will go to England, to visit the Middlesborough iron-making district.

An echo of the famous Homestead strike was heard in the United States District Court at Pittsburgh last week, when Judge Buffington refused to naturalize Hugh Ross, a native of Scotland, on the ground that indictments are still pending against him for offenses connected with the riots. This decision will affect a number of unnaturalized Homesteaders similarly situated.

## MANUFACTURING.

### Iron and Steel.

The annual meeting of the stockholders of the Thomas Iron Company was held on the 12th inst. at the office of the company, at Hokendauqua, Pa. Samuel Roileau of Easton presided, and James W. Weaver of Easton was made secretary of the meeting. The following directors were elected: Samuel Thomas and James W. Fuller, Catsaunks; Charles Stewart and Fred. R. Drake, Easton; W. P. Hardenburgh, Newark, N. J.; W. H. Hulick, New York, and B. F. Fackenthal, Jr., Riegelsville. Mr. Drake was chosen to fill the place of his father, the late Samuel Drake of Easton, and is the only new director on the board. The directors subsequently organized by electing these officers: President, B. F. Fackenthal, Jr.; vice-president, W. H. Hulick; secretary and treasurer, James W. Weaver.

The Spathite Iron Company's furnace, at Florence, Ala., has resumed after completing the necessary repairs and relining.

No. 2 anthracite furnace of the E. & G. Brooke Iron Company, at Birdsboro, Pa., has blown out indefinitely.

It is stated that the Tonawanda Iron & Steel Company of North Tonawanda, N. Y., have blown out.

Penn Iron Company of Lancaster, Pa., who recently resumed work after some weeks suspension, have posted notice of a 10 per cent. reduction in wages, owing to the dullness of trade.

The furnaces of the Crozier Iron Company, at Roanoke, Va., also the American Bridge & Iron Company, and the Duval Engine Works, are running on full time, giving steady employment to all their men.

The furnace of the Etowah Furnace Company, at Etowah, Ala., which has been banked for some time, has gone into operation, giving employment to 150 men.

The 14-inch and the Belgian train and No. 3 furnace at the Albany Iron Works, Troy, N. Y., have been started. The No. 4 furnace will be started later.

At the Burden Iron Works, Troy, two horseshoe trains have been started.

The works of the Ashland Steel Company, Ashland, Ky., which have been idle for over three months, have resumed operations.

The Bessemer steel plant of the Shenango Valley Steel Company, New Castle, Pa., remains idle. If operations are commenced in the near future it is probable that it will be the signal for several other industries to start up. No decision has yet been arrived at regarding the time of resumption.

The rolling mill of Coleman, Shields & Co. of Niles, Ohio, after a shut down, was to have resumed operations, but the men refused to go to work because one of the boss rollers was discharged. It was agreed to leave the matter to a third party for settlement. According to a local paper every other industrial establishment in Niles is in active operation.

The Belleville Steel Company, Belleville, Ill., whose affairs were placed in the hands of receivers in June last by Judge Burroughs of the St. Clair County Circuit Court, are about to be reorganized, and it is expected that work will be resumed at the steel plant early in October. The company's liabilities amount to about \$750,000, and a compromise of the claims has been in progress for some time past, so that creditors whose claims aggregate about 90 per cent. of the entire indebtedness have signed the articles of compromise, which provide that creditors shall receive 50 per cent. of their claims in good securities and 50 per cent. in the stock of the new company.

McIlvain & Sons' plate mill, at Reading, Pa., has resumed on double turn, and the prospects are that the mill will continue in operation all winter.

The John A. Roebling's Sons Company of Trenton, N. J., have started up their works after a two weeks' shut down.

An announcement has been posted in the steel mills and blast furnaces of the Lackawanna Iron & Steel Company of Scranton, Pa., that a reduction of 10 per cent. in the wages of all employees would go into effect at once.

The Cohoes, N. Y., Tube Works Company have made a reduction of 10 per cent. in wages, as a result of a drop in the price of tubes, promising to return to the old schedule as soon as the market improves.

The trouble with the puddlers at the American Sheet Mills, at Phillipsburg, N. J., has been settled, and the mills have started full time.

The puddle mill of the Glasgow Iron Company, at Pottstown, Pa., has resumed operations.

The York Rolling Mill, at York, Pa., has started up with a full force of 300 to 400 hands, after a suspension of several months.

A press dispatch from Bellaire, Ohio, under date of September 18, says that the Bellaire, Riverside and Wheeling Iron & Steel Company's works in that city and Benwood, W. Va., started after ten weeks' stoppage at a reduction of wages of from 20 to 30 per cent.

The American Wire Nail Company of Anderson, Ind., have posted a notice to the effect that their works will in the future be operated with non-union labor. Operations will be resumed as early as possible. Trouble has existed for some time between the company and the Amalgamated Association.

The black plate mills of the New Castle Steel & Tin Plate Company, New Castle, Pa., are now completed and everything is ready for operations. The engines and roll trains have been running several weeks and have got down to their bearings. The tinning department is nearly completed. It is probable that this plant will be put into operation as soon as the steel plant of the Shenango Valley Steel Company starts up.

The Glamorgan Works, at Lynchburg, Va., are running on full time and have sufficient orders on their books to keep them busy for several months.

The Girard Furnace, at Girard, Ohio, recently turned out 195 tons of pig iron in one day.

The galvanizing plant of the Cambridge Iron & Steel Company, Cambridge, Ohio, was put into operation last week. Very satisfactory results of the trial run are reported. These works are equipped with patented machinery, which is said to work perfectly.

The 175 employees of the Marshalltown Iron Works of Wilmington, Del., struck against a reduction in wages and the works were closed.

### Machinery.

A contract for a 15,000,000-gallon pumping engine to be erected at the Pettaconsett Station, Providence, R. I., has been awarded to the Henry P. Worthington Company of New York. The contract requires the engine to be in position and ready for operation by May 15 next.

The Jones & Lamson Machine Company of Springfield, Vt., have started up their new shops with a full force of hands.

The new plant of the Bridgeton Iron Works, at Bridgeton, N. J., is rapidly nearing completion.

The molders employed in the works of the Farrel Foundry & Machine Company and the Birmingham Iron Foundry, at Ansonia, Conn., who recently struck against a reduction in wages, have returned to work at the companies' terms.

The Reading Iron Company of Reading, Pa., call attention to their Scott Foundry Department. The machine shop is equipped with standard heavy tools of the largest sizes, such as a 10-foot planer, 10-foot lathe, 20-foot boring mill and 42-inch stroke slotter. In addition to these, they have a large number of special machines, among them being a very large floor boring machine, roll lathes and gun lathes. They are thus enabled to readily handle a large class of work that is extremely difficult to execute. One of their specialties is the boring of long cylinders and axial holes through shafts. The foundry is prepared to make castings up to 40 tons weight. Besides cupolas, the foundry is equipped with three air furnaces from which they make charcoal gun iron castings of high tensile strength. These castings for cylinders, both hydraulic and steam, cranks, crank shafts, gearing, cross heads and many other purposes, are claimed to be preferable to steel castings. The blacksmith shop is prepared to handle unusually heavy smith work. The boiler shop is equipped with a power riveter. They will contract for the construction of special heavy machinery that most shops are unprepared to handle. The fact that the company operate their own blast furnaces, rolling mills, tube works, steam forge, foundry and machine works enables them to secure to their customers the economy of the various stages of manufacture.

Owing to the rapidly increasing orders the La France Engine Company of Elmira, N. Y., are about to extend their plant by the addition of a coppersmithing shop 42 feet square. A large amount of tools has been purchased and the increase in the capacity of the works will probably give employment to 10 or 12 new men from the start.

The Boomer & Boschert Press Company of Syracuse, N. Y., have constructed a large gang hydraulic vulcanizer press. It is the largest piece of apparatus of the kind ever made in that city and is a fine piece of mechanism. It weighs over 30 tons and was designed and manufactured for Pirelli & Co. of Milan, Italy. It will be used in the manufacture of vulcanite rubber and has four 12-inch cylinders, which have a pressure power of 2500 pounds to the square inch, or 560 tons in all. The upper and lower plates are chambered and heat by steam. These are 48½ x 134 inches and 1½ inches thick, the lower one being fitted to a carriage, so as to run under the press. Attached to the press is an equalizer, thus making the movement perfectly even. The press is run by an accumulator, while the accumulator in turn is operated by a steam pump.

A carload of machinery has arrived at the Watervliet, N. Y., arsenal from the Pond Tool Company's works, at Plainfield, N. J. The work of putting it in position will be begun at once. The remainder of the lathes are expected soon.

The J. S. Graham Machine Company of Rochester, N. Y., have been incorporated to manufacture and sell machinery. The capital stock is \$60,000, divided into 600 shares. The directors are: J. S. Graham, John Kane and W. J. Graham.

G. Harrison Lynch, George Warner and King H. Freeman of Utica, N. Y., have organized the Whitesboro, N. Y., Iron & Brass Foundry Company. Their plant will at first employ about 12 men and the number will be gradually increased.

Charles Carroll and John McNulty of Oswego, N. Y., will start a new boiler shop. The former has been assistant foreman at Kingsford's shop and is a first-class mechanic. Mr. McNulty is the foreman of the N. Y. O. & W. shops at Middletown, N. Y., and a boiler maker of large experience.

The statement of the discharge of two machinists by the Morse Twist Drill & Machine Company of New Bedford, Mass., has given rise to the erroneous statement that a number had been placed out of employment. Since the plant employ 280 to 300 hands, the discharge of two machinists has been given undue prominence.

The statement that the Morgan Hammer Works, at Alliance, Ohio, had been idle for some time and had again resumed operations, is pronounced untrue. The company shut down in part for three days in August to take inventory, but the works have been running day and night.

Ridgway & Son's machine shop and foundry, at Coatesville, Pa., have been closed in consequence, it is stated, of an absence of orders.

The strike of machinists, boiler makers, molders and shop hands in the several shops of the Louisville & Nashville Railroad is still on.

The pulley manufacturing plant of the Lausing D. Warner Mfg. Company of North Milwaukee, Wis., has gone into the hands of a receiver, although it is claimed that the firm are perfectly solvent. The factory closed down some time ago and is not likely to be started up until times are better. The failure was caused entirely by the inability of the firm to borrow money, it is said. The company were organized but a short time ago, and have a large plant at North Milwaukee, which when running to its full capacity gave employment to over 200 men. It is said that the assets of the company are fully \$40,000 and the liabilities are not over \$7000.

#### Hardware.

The Millbury Edge Tool Works, Charles Buck, proprietor, Millbury, Mass., which have been shut down for some time in order to move machinery into the new shop, have again started up.

The water power at the Capewell Horse Nail Company's factories, at Hartford, Conn., is supplied by artesian wells. Some weeks ago the supply ran short. Huge rocks were discovered near the bottom, and it was determined to blast them. This was done and the original quantity of water has been doubled.

At the annual election of the New York Wire Cloth Company, held recently, L. H. Root of Hamilton, N. Y., was elected president, J. Maus Schermerhorn of New York, vice-president; and F. W. DeWitt, treasurer.

The Heller Mfg. Company, Limited, have been organized at Montclair, N. J., by Peter J. Heller, Thomas Truesdell, Austin Van Gleson, William C. Heller and James E. Dyer. The company will manufacture tools and other iron and steel implements.

The Monitor Mfg. Company, Minneapolis, Minn., manufacturers of farm implements, seeders, &c., have resumed operations. Two hundred men are employed.

The knife factory at Fayetteville, N. Y., which has been closed down for a couple of months, has started up again, employing the usual force of men.

The works of the St. Louis Stamping Company, St. Louis, Mo., have resumed activity. The works, when in full operation, employ about 2000 hands, who have been idle for the past two months.

The Eastern Tinware Company's factory, at Portland, Conn., is again in operation, working 40 hours per week.

The Phelps Metal Company have been organized at Syracuse, N. Y. They will manufacture cutlery and hollow ware. The capital stock is \$50,000.

A reduction in wages has been made by several of the leading manufacturers of firearms.

The McCormick Mfg. Company have completed the final arrangements for the purchase of a lot on South Main street, Council Bluffs, Iowa, upon which they will erect a large implement warehouse for the distribution of their goods throughout the West.

The rake factory and dry sheds of S. Buschlen, Port Elgin, Ont., were destroyed August 31. The total loss on stock, machinery and buildings was \$6000, there being no insurance.

The new implement manufacturing company at Beaver Dam, Wis., have their plant about completed, and will begin the manufacture of goods in a few days.

L. S. Starrett has purchased a tract of land embracing some 1000 feet at Lake Park, Mass., north of the Crandall House. When the addition to the Starrett tool factory is completed it is expected that houses for workmen will be erected on the new purchase.

Corbin & Beaton, Southampton, Conn., have begun the manufacture of plumbers' supplies, being located in the abandoned match shop.

The Dexter Tool Company, Bangor, Maine, who were obliged to close down on account of low water, have started their factory again.

A reorganization of Waterbury & Co., cordage makers, under the title of L. Waterbury & Co., has been effected. It is believed that this action will harmonize the constituency of the Cordage Trust.

The American Wire Nail Company, Anderson, Ind., employing 600 men, posted a notice on September 13 that hereafter the company would operate all their mills non-union, work to be resumed as early as possible between that date and October 1.

The scythe shops of the American Edge Tool Company, at Ballston, N. Y., which were burned last fall and have since been rebuilt, will resume work about September 15, giving employment to about 200 men.

Smith & Wesson, Springfield, Mass., have ordered a general cut down of 10 per cent. in wages, to take effect October 1. The firm give as a reason the uncertainty on the tariff question.

The Braddock Wire Company are negotiating to secure the site of the Fort Pitt tannery, which was recently burned. The two properties adjoin each other and the wire company want the extra ground for large extensions of their plant.

The Snap & Tool Company, North Attleboro, Mass., are making improvements in their plant.

It is reported that C. A. Godcharles Nail Works, employing 250 hands, and the City Nail Works, employing 150 hands, both located at Milton, Pa., have resumed work.

Coates Clipper Mfg. Company, Worcester, Mass., manufacturers of a large line of clippers, are occupying a new brick building, 150 x 50 feet, two stories and basement, aggregating 22,000 square feet of floor

space. The new plant adjoins their old factory.

The American File Company, Pawtucket, R. I., have started up their works again.

The trouble that existed between the American Axe & Tool Company, Beaver Falls, Pa., and the grinders and polishers, has been amicably settled, and the men have gone to work.

It is reported that the prospects of the Eaton-Ritchell Company, manufacturers of plain and japanned tinware, of Denver, Col., of locating their plant in South Omaha, are good. The plant will give employment to about 100 men.

The West Haven Buckle Company, West Haven, Conn., whose factory has been shut down for some time past on account of inability to get material to fill orders, reopened September 11.

The Cutaway Harrow Company, Higganum, Maine, started up September 5.

Clayton Brothers of Bristol, Conn., manufacturers of hardware specialties, started up their works on September 18.

The Eagle Lock Company, Terryville, Conn., laid off a number of their men during the past week.

Clark Brothers & Co., Milldale, Conn., manufacturers of bolts, have commenced running their plant on full time after a shut down of some ten weeks.

The Union Hardware Company of Torrington, Conn., who shut down some time ago for two weeks, have since been running a portion of their departments. It is now their intention to start up their entire plant at once.

#### Miscellaneous.

The Rogers Locomotive Works of Paterson, N. J., employing 1100 hands, have made a reduction in wages of from 5 to 35 per cent.

The Columbia Can Machine Company have been organized at Saco, Maine, for the purpose of manufacturing and dealing in cans of all kinds, together with tools and materials used in such manufacture, with \$250,000 capital stock. The officers are: President, Clinton M. Dyer of Worcester, Mass.; treasurer, Charles F. Sanborn of Cambridgeport, Mass.

The malleable iron works at West Troy, N. Y., have started their furnaces and it is expected that in a few days the plant will be running in full, if the men are available. When in complete operation the works give employment to 600 men.

The Richelieu & Ontario Navigation Company's shops, at Sorel, Ontario, have been destroyed by fire, together with a quantity of valuable machinery and tools. The loss is about \$25,000, fully covered by insurance.

The New Jersey Zinc & Iron Works, at Newark, N. J., employing about 200 hands, have closed down indefinitely.

On application a receiver has been appointed for the Palmer Mfg. Company of Brooklyn, N. Y., manufacturers of brassware. It is stated that the assets are about \$45,000, while the liabilities are thought to be more.

The plans of the new plant of the Gatling Ordnance Company, which is under way at Buffalo, N. Y., include a furnace building 100 x 80 feet and a producer building almost as large. In the latter the gas is used to melt the steel employed in manufacturing. A branch railroad track ½ mile long will run through the property.

The wages of the highest-priced men at the West Troy, N. Y., Malleable Iron Works have been cut 25 cents a day. The company state that the reduction is due to the quiet condition of business, and that only about a dozen men are affected by the cut.

The Cahill Iron Works and the stove works of Gibson & Love of Chattanooga, Tenn., started up this week with a full force after a shut down of some time. They report a good number of orders ahead.

The Bertha Zinc Company of Pulaski, Va., have all ten of their furnaces in operation and report business good, with the outlook very encouraging.

The car shops of the Penn Gas Coal Company, at Penn, Pa., have been burned, together with several cars and the full equipment of tools.

A report is going the rounds of the daily press to the effect that the Baldwin Locomotives Works of Philadelphia contemplate the erection of a branch establishment at Allentown, Pa.



# TRADE REPORT

While it is probable that manufacturers in different branches of the Iron and Steel trades have started to some extent on old orders, delivery on which had been previously postponed, it is true that the great majority of them are skirmishing about in a very lively fashion to secure additional work. Unless costs have been modified in a very extraordinary manner during the last three months, some sellers are going ahead without any reference to cost sheets. The actions of some of the largest producers seem to indicate that they do not hold any rosy views concerning the near future. They are taking business, wherever it is in sight, at unparalleled prices.

The performances in the Pittsburgh Steel Billet market are particularly noteworthy. It is conceded that \$19 has been done. But buyers affirm that they have been asked to bid \$18.50, and it is claimed that at least in one instance a considerably lower price has been named by a seller. Offerings in Eastern markets seem to indicate that sellers have got down pretty close to the \$18.50 basis in the Pittsburgh district.

It is intimated that this slaughtering of prices is due to the desire of at least one large producer to convert heavy accumulations of Pig Iron into money.

The easing of the money market may be said to be operating in two ways. It is causing the withdrawal from sale of some goods on which the banks had advanced, because those institutions, being able to carry them, believe the time for disposing of them unfavorable. Some manufacturers, however, are pursuing the opposite course because now they know that those to whom they sell can arrange for payment, which they could not do a few weeks since.

We note that there is being advanced, particularly by Southern furnacemen, an argument in support of a possible sharp advance this winter which deserves consideration. Our friends figure out that so little Lake Ore will be on hand at lower Lake ports at the close of navigation that it will not last until the opening of the season of 1894. Hence there will be a scarcity reflected in high prices, which will give Southern makers a chance to make a very substantial advance. Such a contingency could happen only if there were a very active trade in the fall and winter and if, particularly, the Steel Rail trade were to return to a normal condition. Good authorities in the Steel trade question whether the latter would happen even if the railroads had money and even if there should be a revolutionary change in present prices.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., September 9, 1898.

There is so little change from last week that the same remarks would apply equally well at this time. There is a little more business in some lines, a little less in others, and in all lines a tendency toward lower prices. It would not be difficult to present a theory to the effect that such low prices cannot continue, but there is the stubborn fact that they not only continue, but they get worse. Production, as every one knows, has been enormously curtailed, but consumption has been curtailed in still larger proportions, hence the continuous decline in prices. Of course there must be a turn some day, and the longer the wait the more violent the reaction, but there is no sign of it yet. Those who need material buy just as little as possible, and those who can get along without buying anything seem to find no inducement in low prices. Sellers are equally unwilling to do business except with good parties, and in such cases prices are cut to pieces. Therefore there are all sorts of prices. There is one price for small lots on the usual terms of credit to parties who are considered fair risks, there is another price to those who are regarded as financially strong, and still another price to those who can pay spot cash. This is not always due to caprice on the part of the sellers, either, but more because they cannot afford to take risks, and sometimes because they must have cash. As to the volume of business, it cannot be said to show much improvement, and considering the extremely limited business done during the past three months, it is astonishing how small the demand is. Money is said to be getting easier, but the mischief is done. When business could have been had there was no money to handle it; now it is reversed, or soon will be—plenty of money but no business.

**Pig Iron.**—The market is less favorable than might be expected, considering that the money panic is pretty well at an end. There is some demand, of course, but there are more sellers than buyers, and as the latter are extremely conservative the volume of business is rather disappointing. The general tendency has been toward somewhat lower figures, and would probably be still more so if large lots could be moved for cash or for first class negotiable paper. As there is only a limited supply of these commodities, sellers content themselves with such business as they can get in small lots, and as near to quoted rates as possible, which for Philadelphia and equivalent points are usually about as follows: \$12.50 @ \$13, delivered, for Gray Forge or Plain No. 2, \$13.75 @ \$14.25 for No. 2x and \$14.50 @ \$14.75 for No. 1x.

**Steel Billets.**—Prices have had a further decline, with sales of Western Steel at \$21.25, delivered to mills around here. Asking prices, however, are now \$21.50 @ \$21.75, but there is very little disposition to buy, although it is intimated that extremely low figures would be considered, provided the quantity was worth while and delivery within 30 or 60 days. Without making a firm offer it is impossible to say what might be done, but if the terms of settlement were satisfactory it is thought that very close to \$21 could be done.

**Finished Material.**—There is no decided change to note in this department.

There is a little more business in some lines, but nothing to make much difference to the mills. There are a few contracts for Structural work, one or two for boiler work and one for gas tanks that will require a good deal of material—possibly 2000 to 3000 tons all told; but as all the mills are hungry for work it will all be swallowed and hardly noticed. Pittsburgh comes in with prices that would be thought incredible in ordinary times, but they seem determined to get the business regardless of consequences, so that good-sized orders, instead of being a benefit, are the reverse, as they establish prices which nobody can meet without making a loss. Small orders are coming in somewhat better, and enable local mills to keep their doors open, but there is nothing to enable manufacturers to work to advantage. Still, they are hoping for something better, and after such a long period of inactivity there surely must be an improvement soon. Prices vary according to what the order may be, but for small lots asking rates are about as follows:

Grooved Skelp. delivered.	1.50¢	@	1.55¢
Best Refined Bars.....	1.55¢	@	1.60¢
At interior points.....	1.50¢	@	1.55¢
Tank Steel.....	1.65¢	@	1.70¢
Heavy Plates.....	1.70¢	@	1.75¢
Shell.....	1.80¢	@	1.90¢
Flange.....	2.00¢	@	2.20¢

**Old Material.**—The demand is very disappointing, and prices are beginning to show renewed weakness. Those who must sell have no alternative but to accept lower prices, but asking rates are usually about as follows:

No. 1 Wrought Scrap, delivered.....	\$12.50	@	\$13.50
Machinery Cast, delivered	10.50	@	11.00
Heavy Steel Scrap, delivered.....	13.00	@	14.00
Old Iron Rails, delivered.	15.00	@	16.00
Old Street Rails, delivered.....	17.00	@	18.00
Wrought Turnings, delivered.....	10.00	@	11.00
Cast Borings, delivered....	6.50	@	7.00
No. 2 Light Scrap, new....	8.00	@	8.50
No. 2 Light Scrap, old....	6.00	@	7.00

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, September 20, 1898.

The better feeling reported last week continues, but slow progress is being made in the line of a larger volume of business. Buyers are not taking hold heartily, but are very cautiously testing the situation, and are evidently not pushed to make purchases by their necessities. Agricultural implement makers are resuming operations again, and by the first or second week in October it is expected that all the large concerns will be in active operation. Reports from many of these are to the effect that they have by no means covered their wants for material, and a good demand is still to be expected from them, but the railroads are buying very sparingly, and until they change their policy an important stimulus to business will be lacking. The general demand for Iron and Steel moves along by fits and starts, and the trade is disturbed to some extent by the efforts of mills which have started to keep their order books filled and consequently making very low prices.

**Pig Iron.**—Inquiries are more numerous and the feeling is steadily growing better. Even consumers of Charcoal Iron are testing the market. Many of the inquiries now received are contingent on the starting up of foundries. The foundrymen are hopeful

that they will soon have sufficient work to resume operations, and in that event a great deal of Iron will have to be purchased. The market is watched very closely, and indications of any kind of a buying movement are expected to bring other customers in. The resumption of operations by the Agricultural Implement works will make shipments heavier within the coming month. This is also expected to influence the Charcoal Iron market, as a good demand will then be thrown on the Malleable works, which have for some time been doing but little. The forest fires in Wisconsin have done much havoc in the sections supplying Charcoal to furnaces. This will have its effect on the production of Charcoal Iron later in the fall. Quotations are now as follows for cash:

Lake Superior Charcoal.....	\$16.00 @ \$16.50
Local Coke Foundry, No. 1.....	13.50 @ 14.00
Local Coke Foundry, No. 2.....	12.75 @ 13.00
Local Coke Foundry, No. 3.....	12.50 @ 12.75
Local Scotch.....	14.01 @ 14.50
Ohio Strong Softeners No. 1.....	15.50 @ 16.00
Southern Silvery, No. 1.....	@ 14.50
Southern Silvery, No. 2.....	@ 14.00
Southern Coke, No. 2.....	12.35 @ 12.60
Southern Coke, No. 3.....	11.60 @ 11.85
Southern, No. 1, Soft.....	12.35 @ 12.60
Southern, No. 2, Soft.....	11.85 @ 12.10
Southern Gray Forge.....	11.10 @ 11.35
Tennessee Charcoal, No. 1.....	16.00 @ 16.50
Alabama Car Wheel.....	18.50 @ 18.75
Hocking Valley, No. 1.....	15.25 @ 16.00
Jackson County Silvery.....	16.00 @ 17.00

**Bars**—Inquiries are good, but the market does not harden. On the contrary, the mills that have started are making strenuous efforts to keep in operation and are naming lower prices. This influence seems to be local rather than general. The effect is only felt within a limited territory and sales are reported by mills making a general assortment at better figures, showing that competition has not extended to all localities. The Mahoning Valley mills are quoting for future delivery on the basis of 1.35¢ @ 1.40¢, at mill, half extras, which is equivalent to 1.48¢ @ 1.53¢, Chicago. The local mills quote 1.45¢, and this is shaded on anything like a good specification. Soft Steel Bars are quoted on a wide range of prices, but strictly first-class Soft Steel made from Billets of exact carbon contents are very firmly held at 1.60¢ @ 1.65¢, Chicago. Jobbers report a very good demand from stock. Confidence seems to have been re-established among small consumers, who are now resuming operations, while the large consumers are drawing supplies quite freely from jobbers' warehouses. Quotations are generally maintained now at 1.70¢ @ 1.75¢ for small lots of either Bar Iron or Soft Steel.

**Structural Material.**—The only business of importance coming to light during the past week originated in Milwaukee and was divided among three establishments. No large contracts for Beams were placed in this vicinity, but business in small lots has been fair. Quotations are maintained at the following prices on mill shipments, Chicago delivery: Beams, 1.75¢ @ 1.90¢; Tees, 1.95¢ @ 2.05¢; Angles and Universal Plates, 1.75¢ @ 1.80¢.

**Plates**—The demand is a little better. Inquiries are more numerous and the prospects for a better trade are quite encouraging. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.75¢ @ 1.80¢; Shell Steel, 2¢ @ 2.10¢; Flange Steel, 2.15¢ @ 2.30¢; Fire Box, 2.75¢ @ 5¢. Store prices now prevail as follows: Iron or Steel Sheets, Nos. 10 to 14, 2.25¢ @ 2.40¢; Tank Steel, 2.10¢ @ 2.20¢; Shell Steel, 2.20¢ @ 2.40¢; Flange Steel, 2.50¢ @ 2.65¢; Boiler

Tubes, 67½¢. A good demand for Boiler Tubes was experienced during the week, owing to the continued amount of repair work now going on.

**Sheets.**—Black Sheets are less active, and prices are a little weaker, and No. 27 Common is now quoted at 2.75¢ @ 2.80¢ on mill shipments, Chicago delivery. Small lots from stock are quoted at 3¢ @ 3.10¢. Galvanized Iron is in better demand and stocks in warehouses are being freely drawn upon. Prices continue low, Juniata being quoted at 70 and 10 and 5¢ for mill shipments, and 70¢ @ 70 and 7½¢ for small lots from stock. Sheet Copper is in fair demand at 30 and 35¢ off.

**Merchant Steel.**—Not much new business is reported in this line, but shipments are now beginning to go forward in good volume to consumers. The starting up of the Agricultural Implement works is expected to lead to a better trade in the near future. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel at 1.90¢ @ 2¢; Ordinary Bessemer Machinery, 1.65¢ @ 1.70¢; Ordinary Tool Steel, at 6¢ @ 7¢; Specials, 12¢ and upward.

**Rails and Track Supplies.**—The South Chicago Rail mill is now idle, and will probably remain so for some months to come. The closing of this mill appears to have had no effect on the Rail trade. A few inquiries are being received. The Illinois Steel Company, however, have a fair quantity of standard sections in stock, so that they are prepared to fill small orders as they are received. The demand for Fastenings is very light. Quotations are unchanged at \$30 @ \$32 for Steel Rails, 1.60¢ @ 1.65¢ for Iron and Steel Splice Bars, 2.55¢ @ 2.60¢ for Track Bolts with Hexagon Nuts and 1.85¢ @ 1.90¢ for Spikes.

**Old Rails and Car Wheels.**—The only transaction in Old Iron Rails during the past week was one of a few hundred tons at \$14.50. This appears to be the ruling price to which this material has settled. Plenty of stock is being offered at this price or very close to it. Old Steel Rails, short lengths, are in some little demand and will bring about \$9 here. Long lengths seem to be in no demand whatever, and while their probable value is \$11, it would be difficult to place any considerable quantity at even that price. A few carloads of Old Car Wheels were sold at \$14.

**Scrap.**—The inquiries reported last week from Ohio mills led to no business, as the offers made were lower than dealers would accept. The selling price per net ton continues as reported last week.

**Metals.**—Lake Copper is stronger, and is now quoted at 10½¢ for carload lots. Casting Copper is very firm at 9.75¢, and indications are that it will shortly advance. Spelter is a little firmer, at 3.50¢ @ 3.60¢.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, September 20, 1893.

The demand for Pig Iron has kept up fairly well this week, the sales aggregating about 15,000 tons, largely for stove works and for purposes presumed to be for mixing and for Pipe works. The prices which have been ob-

tained were \$7 for Gray Forge and \$7.50 for No. 3 Foundry, f.o.b. Birmingham, and these prices, with \$8.25 for No. 2 Foundry, seem still to find sellers, for when more has been asked sales could not be effected, although it seems probable that about all of the Iron obtainable at these low prices has been closed out; at any rate, it is certain that many furnaces in the South will not entertain further bids except at an advance of 25¢ per ton. There is a pretty liberal number of orders for single carloads of Pig Iron passing, and there is an enlargement in the demand from the East for various kinds of Iron. There are more inquiries for long forward delivery, but the furnaces are not disposed to entertain them except at such an advance in price as prohibits trading. There is no movement in Charcoal Iron; in fact, there is not much trading in other leading kinds of Southern Coke Iron. The undertone seems to be strengthening and an advance must take place if the demand keeps up. Quotations as follows:

### Foundry.

Southern Coke, No. 1.....	\$12.75 @ \$13.00
Southern Coke No. 2.....	10.75 @ 11.00
Southern Coke No. 3.....	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 14.75
Lake Superior Coke No. 1.....	15.00 @ 15.25
Lake Superior Coke No. 2.....	14.00 @ 14.25
Hanging Rock Charcoal, No. 1.....	18.50 @ 19.00
Hanging Rock Charcoal, No. 2.....	17.50 @ 18.00
Tennessee Charcoal, No. 1.....	14.00 @ 14.25
Tennessee Charcoal, No. 2.....	13.00 @ 13.25

### Forge.

Gray Forge.....	10.00 @ 10.25
Mottled Coke.....	9.75 @ 10.00

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	17.75 @ 18.00
Lake Superior Car Wheel and Malleable.....	17.00 @ 17.25

## St. Louis.

(By Telegraph.)

Office of *The Iron Age*,  
Bank of Commerce Building,  
St. Louis, September 20, 1893.

**Pig Iron.**—There is no particular change to note since our last report. Inquiries run largely for small lots of Coke Iron for prompt delivery at slightly advanced prices. Consumption improves daily and manufacturers are rapidly getting into shape to use their usual complement of Iron. A depressing feature of the market is the size of unsold stocks in furnace hands. While carload orders and 50-ton lots are sold at prices quoted below, there are special inducements offered to large buyers in the shape of lower prices, which, however, does not induce buying to any extent whatever. Conservative judges of the market conclude that prices ruling to-day will continue during the winter months and not until the spring trade sets in will any improvement take place. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$13.25 @ \$13.50
Southern Coke, No. 2 Foundry.....	11.75 @ 12.00
Southern Coke, No. 3 Foundry.....	11.25 @ 11.50
Southern Gray Forge.....	10.50 @ 10.75
Southern Car Wheel.....	17.50 @ 18.00
Lake Superior Car Wheel.....	16.75 @ 17.25
Ohio Softeners.....	16.00 @ 16.50
Missouri Charcoal, No. 1 Foundry.....	13.00 @ 13.50

**Bar Iron.**—A fairly active trade is reported by jobbers, while mills are only picking up occasional orders. Many are closed down, while others continue to run on part time. Prices are unchanged as follows, from mill: 1.50¢, half extras, f.o.b. cars East St.

Louis. Jobbers quote 1.70¢ @ 1.75¢ for lots from store.

**Barb Wire.**—The improvement in the demand continues, although it has not as yet reached the point where mills cannot fill all orders as soon as received. Jobbers are also feeling the improvement, and as most of the low-priced Wire has been withdrawn from the market they get full prices. Mills quote \$2 for carload lots of Painted, with 45¢ per cwt. additional for Galvanized. Jobbers ask \$2.10 @ \$2.15 for small lots of Painted from store.

**Wire Nails.**—The movement in Wire Nails continues to gain strength daily, and some good sales are reported. Jobbers find their stocks more or less broken, and mills who have been only working half turn are gradually increasing their force and with a continuance of the present demand will soon be running full time. Mills quote \$1.55 for carload lots to jobbers, while the latter quote \$1.65 for small lots from store.

**Rails and Track Supplies.**—Steel Rails are still dull and neglected and are nominally quoted at \$30 @ \$31. Track Supplies are unchanged, as follows: Splice Bars, 1.65¢ @ 1.70¢; Spikes, 1.90¢ @ 1.95¢; Bolts, Square Nuts, 2.50¢; with Hexagon Nuts, 2.60¢. Old Iron Rails are unchanged at \$15.

**Pig Lead.**—The market has been without feature during the past week. Sales were light and 3.67½¢ @ 3.70¢ were the prevailing prices. Stocks in producers' hands are not large and a steady market for the balance of the year is anticipated.

**Spelter.**—This metal continues to show a fair degree of strength. The demand is only fair, however, and until some improvement in this direction takes place an advance in prices is out of the question. The statistical condition of Spelter is good and at to-day's prices it looks cheap.

## New York.

Office of *The Iron Age*, 96-102 Reade street, {  
NEW YORK, September 20, 1898. }

**Pig Iron.**—There has been very little movement, although the starting of a number of foundries is bringing some inquiry for small lots. It is probable, however, that in the majority of cases buyers avail themselves of postponed deliveries to cover their immediate requirements. The 5000-ton lot of Southern Iron which bankers were offering last week has been withdrawn, the pressure for money having probably become less, so that it is possible to await a more favorable period for disposing of the iron. Thus far only 300 tons of Southern Charcoal Iron have been announced to be sold at auction. We quote Northern brands \$14 @ \$15 for No. 1; \$13 @ \$14.25 for No. 2; \$12.25 @ \$12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$13.25 @ \$14.25 for No. 1; \$12.25 @ \$13.25 for No. 2; \$11.50 @ \$12.25 for No. 3; \$11.75 @ \$12.25 for No. 2 Soft, and \$12.25 @ \$12.50 for No. 1 Soft. Gray Forge is \$11.25 @ \$12.

**Ferromanganese and Spiegeleisen.**—Some of the English makers of Ferromanganese have instructed their representatives here to abstain from selling, because the Coal strike has stopped production. Business, however, continues lifeless, with quotations for Ferromanganese, 80 %, nominally \$56 @ \$57.

**Billets and Rods.**—Very low offerings of Billets are being made by West-

ern works, and prices have declined materially. Nothing is being done in foreign material. We quote nominally: Domestic Billets, \$21.50 @ \$23, and foreign Billets, \$28 @ \$28.50, tide-water; domestic Wire Rods, \$30 @ \$31, and foreign Rods, \$39.50 @ \$40.

**Steel Rails.**—The market is lifeless. Even if the railroads were in a position to buy, or to pay for what they have already ordered, they could not be expected to call for anything but what they need for immediate requirements. There is no possibility of any advance before spring, while there are contingencies which might lead to lower figures.

**Track Material.**—We quote: Spikes, 1.80¢ @ 1.90¢; Fish Plates, 1.45¢ @ 1.60¢; Track Bolts, Square Nuts, 2.25¢ @ 2.40¢, and Hexagon Nuts, 2.40¢ @ 2.50¢, delivered.

**Manufactured Iron and Steel.**—The market is very quiet in all lines, and no contracts of magnitude have been placed or are now on the market. We quote: Beams up to 15-inch, 1.80¢ @ 2¢; 20-inch, 2.10¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.70¢ @ 1.90¢; Tees, 2¢ @ 2.15¢; Channels, 1.80¢ @ 2¢, on dock. Steel Plates are 1.65¢ @ 1.90¢ for Tank; 1.90¢ @ 2.10¢ for Shell; 2¢ @ 2.15¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.55¢ @ 1.9¢, on dock, and Common, 1.45¢ @ 1.55¢; Soft Steel Bars are 1.50¢ @ 1.70¢; Scrap Axles are quotable at 1.75¢ @ 2.10¢, delivered; Steel Axles, 1.70¢ @ 2¢, and Links and Pins, 1.70¢ @ 1.80¢; Steel Hoops, 1.75¢ @ 1.90¢, delivered; Cotton Ties, 70¢ @ 72½¢ per bundle, at mill.

**Old Material.**—Occasional sacrifice sales by some of the railroads have dragged prices down to an unheard of level, and in some cases the following quotations have even been shaded, when terms were particularly favorable: Old Iron Rails, \$13 @ \$14; Old Steel Rails, \$8 @ \$10, and No. 1 Scrap, \$10 @ \$12.

## Financial.

The continued delay of the Senate in coming to a vote in the matter of repeal of the Silver Purchase law has, as might have been expected, caused somewhat of a reaction from the buoyant feeling which set in after the decisive action of the Lower House last month. A growing sentiment of uncertainty and distrust appears to have been creeping over the public mind during the past few days, which is reflected in a stagnant stock market and unusual hesitancy on Wall street. It is feared that there is some political manipulation going on which may after all defeat the wishes and expectations of the country in regard to the much needed reform now before Congress. There is, in fact, a pause in the business situation. Until business men see more cause for confidence in the ultimate passage of the measure they will be inclined to go slow and play a waiting game. Therefore the rapid recovery of the past two or three weeks has experienced a check, and future developments will depend mainly upon the action of the legislators at Washington.

Meanwhile things are in good shape for continued improvement should matters at the capital take a favorable turn. Money is abundant. The vast amount hoarded during the panic has at length found its way into the normal channels. New York banks, indeed, are

experiencing almost a glut of funds at the present time, and more money is being received by them every day from the interior than they are shipping to institutions, so that they find a difficulty in disposing of their surplus circulation. Loans are freely offered at advantageous rates, but under the present circumstances manufacturers and others hesitate about availing themselves of the accommodation. Until confidence is absolutely restored, by the restoration of the money system of the United States to a perfectly sound basis, business is likely to be restricted to immediate demands for consumption. The delay, too, is causing a feeling of distrust among European investors, who have, during the past week, developed an increasing unwillingness to take American securities in face of the uncertainty of the Senate's action. This feature is an important one, as it is asserted by high financial authorities that the moment repeal is an accomplished fact Europe is ready to transfer large sums of money to this side for investment.

Saturday's statement of the Clearing House banks showed an even greater increase of reserve than was generally expected, bringing their surplus over legal requirements up to \$10,601,700, as against \$4,879,575 at the same time a year ago. The following table shows the changes as compared with last week's statement:

	September 9.	September 16.	Differences.
Loans..	\$369,996,200	\$365,977,800	Dec. \$4,018,400
Specie..	69,260,900	73,450,900	Inc.. 4,190,000
Legal tend..	27,152,400	31,463,200	Inc.. 4,310,800
Net deposits	373,787,700	377,273,600	Inc.. 3,485,900
Circulation	11,209,400	12,723,600	Inc.. 1,514,200

The decrease in loans is attributed to the fact that many of the banks have been contracting their loans in order to place themselves in a position to cancel some of their outstanding Clearing House loan certificates, and to the liquidation by country banks of accommodations obtained during the stringency.

One effect of the improved condition of the banks has been the retirement during the week under review of more than \$4,750,000 of Clearing House loan certificates, leaving the amount now outstanding in the New York Clearing House \$32,130,000. Some have also been canceled in Boston, and it is probable that more will be retired during the next few days. Many banks are reported to have the bulk of their own certificates back in their vaults, but have not presented them for cancellation from the fear that any adverse action of the Senate may create fresh distrust and render the certificates again necessary.

In the loan market the supply of money on call is abundant. Rates have ranged from 2 % to 4 %, averaging 3 %, and closing at that figure. Renewals are generally made at 3½ %. The market for time loans is decidedly easier.

Dealers say that a dollar in a dry goods store will go further this fall than ever before in the history of trade.

Treasury returns of the aggregate values of the four principal classes of exports during August show an increase of \$3,514,845 over the total for the corresponding period last year. Here are the comparative details:

	1898.	1897.
Breadstuffs.....	\$21,855,228	\$19,036,710
Provisions (including cattle and hogs).....	15,444,563	16,015,265
Petroleum.....	4,084,255	3,707,472
Cotton.....	3,493,481	2,543,235
Totals.....	\$44,877,527	\$41,302,682

Other exports in August last year amounted in value to \$23,544,223; and if they have been no larger last month probable total exports of merchandise during August, 1898, will have been worth over \$68,000,000.

Official figures of imports at all ports last month are not yet available; but the merchandise entries at New York alone declined \$12,054,116, so that even if changes elsewhere did not increase the shrinkage the returns should show a balance of over \$3,000,000 in favor of the United States, as against an excess of imports in August last year of \$12,868,892. But the completed returns are likely to show even more favorable results, as the imports have fallen off at other ports besides New York. The gold movement, which last year showed an excess of exports amounting to \$5,716,000, was also reversed last month, although complete Government data have not yet been published.

Trust companies and individuals are stated to have lent time money freely at 5% for 30 days and 6% for 90 days on fair collateral readily marketable, and at 6% for six months on first-class securities. The supply is said to be increasing, and further easing of rates is looked for. Good double-name commercial paper is being bought to some extent by country banks at about 7 @ 8%, but the supply is not yet very large. A transaction has been noted at 6% within the past few days. Single-name paper is quoted at 10 @ 12%.

Foreign exchange is quiet but firm. Rates have advanced slightly since last report, owing to a scarcity of commercial and arbitrage bills, coupled with an increased demand from remitters. Rates for sterling are quoted as: 60 days, 4.82½; demand, 4.85½; cables, 4.86½ @ 4.86½; commercial, 4.81½ @ 4.81½. Domestic exchange on New York is quoted as follows: New Orleans, commercial 2 25 premium, bank 3.00 premium; Charleston, buying ½ @ ½ discount, selling par; San Francisco, sight 20, telegraph 30 premium; Savannah, buying ½ discount, selling par @ ½ premium; Boston, 35¢ discount; Chicago, 75¢ @ 80¢ premium; St. Louis, \$1.10 premium.

The strength displayed in the stock market in the early part of last week failed to continue to the end. Friday and Saturday developed considerable more weakening in securities than at any time since the revival in stocks after they had reached their lowest level. Even the unexpectedly favorable bank statement failed to give any impetus to the market. The further delay in the Senate appears to have placed a damper on speculation, and it is reported that many of the leading operators have taken the opportunity of snatching a holiday and have absented themselves from 'change during the past week. The stock market was inactive and weak during the first days of the current week, transactions being the lightest known for a long period. Prices have, in the main, shown a marked downward trend, except for a sharp rally late on Tuesday in some of the "industrials," in which one or two railroad stocks participated. Sugar, Tobacco and Chicago Gas were rushed up, owing to various rumors bearing on these stocks. Such business as has been moving has been confined mainly to half a dozen issues, and the supply of stocks has become narrow. It is certainly plain that the shrewd operators who participated in the large dealings during the panic, have temporarily retired from the speculative market, and much stock which was bought in at that time is being now

held for investment. A marked feature of the week in the Stock Exchange has been the little interest taken in American securities by European investors. The following list shows the fluctuations of some of the most active stocks since Thursday, September 14, with the closing prices on September 20:

	High- est.	Low- est.	Closing, Sept. 20.
Am. Sugar Ref.....	90½	84½	86½
Atchison, T. & S. Fé....	21½	18½	20½
Balt. & Ohio.....	71½	69	69½
Chicago Gas.....	61½	57½	60½
Chicago & N. W.....	100½	98½	99½
Chic., B. & Q.....	85½	82½	83½
Chic., Mil. & St. Paul....	61½	59½	60½
Chic., Rock Isl. & Pac....	65½	64½	65
Del., Lack & Western....	143	140½	142½
Gen. Electric.....	49½	45½	47½
Lake Shore.....	122½	121½	122
Louisville & Nashville....	56	53½	54½
Manhattan.....	134	128½	129½
Missouri Pacific.....	27½	25½	26½
Minnesota Iron, asked....			60
National Lead, Common. 32		28½	29½
New York Central.....	102½	102½	102½
N. Y., L. E. & Western. 16		14½	15½
Northern Pacific, Pfd. . 25½		23½	24½
Philadelphia & Reading.. 20½		18½	19
Richmond & West Pt.,			
Term.....	4½	3½	3½
St. Paul & Omaha.....	35½	33½	35½
Union Pacific.....	23½	21½	21½
Western Union.....	83½	82½	83½

Government bonds have been steady, except for a decline of 1½% in the bid price for twos. Closing prices are given as follows:

	Bid.	Asked.
2s, 1891, registered.....	98	...
4s, registered.....	110	111
4s, coupon.....	111	112

Railway and miscellaneous bonds have felt the same adverse influences which have depressed the stock market. During the current week the market for these securities has been dull, with a tendency to lower prices generally and a falling off in the volume of transactions.

Bar silver has advanced, closing in London on Wednesday at 34½ pence per ounce, and in New York at 74½¢ per ounce.

Reports of railroad earnings still show a marked decrease from the corresponding period of last year. The *Financial Chronicle* computes the gross earnings of 134 railroads for August at \$42,274,577, a decrease of \$6,344,348, or 13.05 per cent., as compared with same month last year. The mileage was 2559 miles greater than last year. The losses are pretty well scattered over the whole country, showing that the financial depression has been generally felt. Reports of scanty crops in some sections of the West do not, unfortunately, give much encouragement to hope that the shortage will be made up later in the year. As a further interesting proof of the effect of the late panic on general business, a falling off is shown in the report of the Western Union for the current quarter of over \$400,000 in net revenues.

The anthracite coal trade is gradually improving. A better inquiry is reported and the demand from both East and West is growing. Curtailment of production, which has existed for some weeks, has brought the trade into better shape than for some time past, and an advance of 15¢ @ 25¢ per ton in prices may be anticipated shortly.

The official statement of anthracite coal shipments for August, as compared with the figures of the same month of the previous year, shows a total output of 3,308,768 tons, a decrease of 383,070 tons, making the total output for the year to August 31, 27,607,484 tons, an increase of 887,335 tons as compared with the corresponding period of last year. The stock of coal on hand at

tidewater shipping points August 31, 1898, was 860,175 tons, an increase of 126,729 tons as compared with the amount on hand at the beginning of the month.

## Metal Market.

**Pig Tin.**—The past week has witnessed a further advance of about ½¢ per lb in the price of Straits Tin, and the tone of the market looked stronger than at any previous time since the inauguration of the upward movement. First hand stocks are being steadily reduced at the rate of at least 1200 tons per month, and the quantity unsold in the United States, exclusive of the Pacific Coast, is now between 4500 and 5500 tons, or say equivalent to about four months' consumption. In a speculative way there have been only moderate dealings of late and interest is by no means lively at the present time. Such as it is, the trading is between regular operators. At the close of the week the market was very firm, with sales at 20.50¢ @ 20.55¢ for prompt delivery and 20.70¢ for October. Bids quite as high were made subsequently in the face of lower quotations from London. Straits shipments first half of September were 1075 tons to Great Britain and 400 tons to Continent, against a total of 305 tons during the corresponding period last year.

**Copper.**—No further change in prices has taken place and the market apparently retains very firm tone. Home trade buying seems to be very commonplace, with the amount of Copper involved only fair, but home deliveries and exports together take up enough stock to keep the statistical position good. Lake Superior Ingot is quoted at 9½¢ @ 10¢, according to brand and terms of sale. Electrolytic about 9½¢ @ 9½¢, and the range on common casting stock is 9¼¢ @ 9½¢, all near future delivery.

**Pig Lead.**—Dealings in this metal have been on a moderate scale, and the demand has shown some falling off also, while prices are a shade easier. Thus against 3.85¢ bid a short time ago there have been sales recently at 3.80¢ for October delivery, while 3.85¢ stands as a common asking price at the moment for deliveries running during the balance of the year.

**Spelter.**—The market is wholly unchanged. Dealings have been moderate and chiefly at last week's prices, while buyers' and sellers' ideas of value have remained stationary. Fair quotations would appear to be about 3.75¢ @ 3.80¢ for ordinary Western brands, with the usual premium on choice brands. It was announced on the Metal Exchange that a few hundred tons of Western Spelter have been sold recently for export to London at 3.40¢ in St. Louis, with through rate of freight 30¢ per 100 lb to London, making the sterling cost there £17. 5/ per ton.

**Antimony.**—A fair business is passing and prices show very little movement. We quote at 9½¢ @ 9½¢ for Hallitt's, 10¢ @ 10½¢ for L. X., and 10½¢ @ 10½¢ for Cookson's, in round lots.

**Tin Plates.**—The demand has differed in no marked degree with the average of preceding two or three weeks, and dealings have continued on a very moderate scale, with the aggregate hardly up to a fair average for the season, except, possibly, for ordinary Cokes from Southern canners. Prices have undergone hardly any change. Spo-



quotations are about as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$5.20; J. B. grade, do., \$5.27½; Bessemer full weight, \$5.20; light weights, \$4.85 for 100 lb, \$4.80 for 95 lb, \$4.65 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60; Siemens Steel, IC basis, \$5.65; IX basis, \$6.75. Charcoals—Melyn grade, IC, \$6.35 @ \$6.37½; Crosses, \$8; Allaway grade, IC, \$5.60; Crosses, \$6.75; Grange grade, IC, \$5.70; Crosses, \$6.85. Charcoal Terns—Worcester, 14 x 20, \$5.70; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.50; do., 20 x 28, \$15; Dean grade, 14 x 20, \$5.30 @ \$5.37½; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.32½ @ \$5.35; do., 20 x 28, \$10.40; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$8.90; Abercarne grade, 14 x 20, \$4.60; do., 20 x 28, \$8.80.

The monthly production of Copper in the United States since July, 1892, has been as follows, the first column giving the aggregate returns from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

American Product.			
	Reporting mines.	Outside sources.	Total.
	Gross tons.	Gross tons.	Gross tons.
1892.			
July.....	9,294	924	10,218
August....	10,807	870	11,677
September..	9,710	994	10,704
October....	9,668	1,289	10,957
November..	9,888	1,036	10,924
December..	9,872	1,174	11,046
Total six months	59,239	6,267	65,526
1893.			
January....	9,187	989	10,176
February...	8,213	1,042	9,245
March.....	9,065	1,321	10,386
April.....	11,775	1,042	12,817
May.....	12,706	1,042	13,748
June.....	11,524	1,042	12,566
Total six months	62,470	6,478	68,938
1893.			
July.....	11,049	1,042	12,091
August.....	11,745	1,042	12,787

The product of the foreign reporting mines and the United States exports were as follows:

Foreign reporting mines.			
	Gross tons.	United States exports.	Gross tons.
1892.			
July.....	6,358	3,450	9,808
August....	6,888	1,545	8,433
September..	5,478	1,458	6,936
October....	6,476	3,114	9,590
November..	6,789	3,897	10,686
December..	7,666	4,486	12,152
Total six months	39,655	17,980	57,635
1893.			
January....	5,736	3,171	8,907
February...	6,762	1,815	8,577
March.....	6,896	2,334	9,230
April.....	6,913	3,450	10,363
May.....	6,806	4,482	11,288
June.....	7,935	5,109	13,044
Total six months	41,048	20,361	61,409
1893.			
July.....	6,095	7,181	13,276
August.....	7,057	9,127	16,184

The Paris correspondent of the (London) *Daily News* writes that a new method of producing steel has been suggested to M. Jules Garnier by the success of M. Moissan's diamond-making experiments. He claims that he has successfully carried it out; and that the steel is instantaneously made by placing a bar of iron and a stick of charcoal together in a parallel direction in an electrical furnace and subjecting them to a strong current. M. Garnier, it is said, expects that his discovery will revolutionize the steel industry.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, September 20, 1893.

There was a further slight advance in Pig Tin prices early in the week under the influence of reserved offering and better outlook for consumption. Improvement in consumption on the Continent is said to be more than was expected. Realizations the past few days brought about a reduction of about 20/ in prices. Latest transactions were at £80 for prompts and £83 7/6 for three months' futures. The decline was attributed to heavy shipments from the Straits.

Merchant Bar Copper has declined about 18/9. There has been good consumptive demand and more buying on outside speculative account, but the effect of this movement was offset by persistent selling of forwards by some prominent operators. On Monday quite large sales were made at about 5/ reduction from Friday's prices. Cash metal seems to be rather scarce, although statistics show an increase of 540 tons in stocks and 392 tons increase in European visible supply during the first half of the month. Chili charters were reported as having been 1000 tons. The market at the close was barely steady, with Merchant Bars quoted at £42. 7/6 @ £42. 10/ for prompt delivery and £42. 12/6 @ £42. 15/ for three months' futures, and Best Selected English at £47 @ £47. 5/. Late sales of furnace material include 750 tons Anacanda Argentiferous Matte at 8/9, 200 tons ditto, resale, at 9/, and 1500 tons Argentiferous Montana at 9/ for forward delivery.

Tin-Plate prices are still somewhat irregular, although the firmness lately in Pig Tin and scarcity of Bars prompted more confidence in some quarters. Sales were reported from Swansea of 14 x 20, ordinary Bessemer Cokes, at 11/, f.o.b. there. There has been a little more business in Charcoals, chiefly for Canada, and more inquiry also for Oil sizes. Otherwise American buyers are very quiet. Stocks at Swansea estimated at 245,000 boxes. Liverpool quotations are as follows:

IC Charcoal, Alloway grade.....	12/9 @ 13/3
IC Bessemer Steel, Coke finish.....	11/6 @ 11/9
IC Siemens.....	11/9 @ 12/
IC Coke, B V. grade, 14 x 20.....	11/6 @ 11/9
Charcoal Terne, Dean grade.....	@ 11/6

Pig Lead has been in merely fair demand and prices have remained almost stationary at £9. 15/ @ £9. 17/6 for soft Spanish.

Spelter is without change, demand being moderate, while prices stand at about £17. 5/ @ £17. 7/6 for ordinary Silesian.

In the Iron and Steel trades there has been only a moderate trade and hard y any change in prices has taken place. Steel Rails are quoted 2/6 up and Wrought Scrap a shade higher, but

apart from these and fractional advances on Scotch Pig Iron, no changes are noted. Last dealings in warrants were at 42/7 @ 42/8 for Scotch, 35/3 for Cleveland, and 45/1½ for Hematite.

### Taxing Pay Checks.

On September 8 Mr. Hutchinson, Collector of Internal Revenue at Hartford, sent to the Commissioner of Internal Revenue a specimen of the pay checks issued by the Billings & Spencer Company of Hartford and asked whether such circulation was subject to tax. The Collector has received a letter from Mr. Miller, the assistant commissioner, in which he says: "You are advised that they are notes in the contemplation of section 19 of the act of February 8, 1875, and that the Billings & Spencer Company are liable for a tax of 10 per cent. on the amount used for circulation and paid out by them."

Similar checks were used for paying workmen by Pratt & Whitney, Pratt & Cady, Fowler & Miller, the Pope Bicycle Company, and other large manufacturers in Hartford. Their use continued about three weeks, the checks being payable through the Clearing House, and passing without any objection among tradesmen and others as a circulating medium. It is estimated that the amounts issued by the several manufacturers will aggregate over \$200,000.

We are advised by one of the firms named that the checks used for paying employees have differed in character from an ordinary check only in two respects, viz.: that the amount has been printed in even dollars, and that they have been made payable through the Clearing House only. There was no intention on the part of the manufacturers to issue them as a circulating medium. Manufacturers in Hartford have used checks of the usual kind for pay rolls for years, large amounts having been paid in that manner. Most of the special checks have found their way into the banks within a week of the time of their issue. The manufacturers incline to the opinion that the internal revenue collector has been overzealous, and has misinterpreted the law.

On Tuesday evening, October 3, special exercises will be held in the hall of the Young Men's Institute, 222 to 224 Bowery, New York, to formally open the educational work for the season of 1893-94. This institution has for several years been doing a very valuable work in offering to young men engaged during the day exceptionally good evening classes in subjects bearing directly on their daily work. There are technical subjects which assume a prominent place in the curriculum; classes in carriage drafting, steam engineering, practical electricity, mechanical and architectural drawing and freehand drawing; also penmanship, bookkeeping, shorthand, typewriting, English grammar and composition, vocal music, glee club and first aid to the injured. The school year continues until May, when prizes, diplomas and certificates are awarded. The classes are open to all young men from 17 to 35 years of age.

Low prices have been made lately on imported black plates for tinning. Sales have been made at 3.65 to 3.75 cents.

### Patent and Trade-Mark Congress.

The World's Congress Auxiliary announces an unusually strong and interesting programme for its Patent and Trade-Mark Congress, to be held the first week in October. The influences which encourage or discourage progress are to be considered by able representatives of various countries, particularly England, Germany, Belgium, France, Sweden, Austro-Hungary, Holland, Switzerland, Japan, Canada, Mexico and the United States.

It is expected that Hon. Henry W. Blodgett—for more than 20 years judge of the United States Courts at Chicago, and recently counsel for the United States in the Behring Sea arbitration—will be made permanent president of the Congress, and that representatives of the Association of American Inventors and Manufacturers and of the United States Trade-Mark Association will be made vice-presidents. It is also expected that Hon. Hoke Smith, Secretary of the Interior—the department of our Government from which patents are issued—and Hon. John W. Noble, Ex-Secretary of the Interior, will participate in the proceedings. Among other interesting features will be addresses from Hon. Richard Pope, Canadian Commissioner of Patents; Hon. John S. Seymour, United States Commissioner of Patents and several ex-commissioners; Hon. William F. Draper and Hon. Elijah A. Morse, members of Congress from Massachusetts; Hon. James Buchanan, ex-member of Congress from New Jersey; Hon. Carroll D. Wright, United States Commissioner of Labor; Dr. R. J. Gatling, president Association of American Inventors and Manufacturers; Francis Forbes, secretary United States Trade-Mark Association; Dr. C. Matzudaira, Imperial Japanese Commissioner to the World's Columbian Exposition; Carl Pieper of Germany; W. Lloyd Wise and Miss Ellen Blackburn of England; Dr. Snyder de Wissenkerke of Holland; John Bernstrom of Sweden; C. O. Paget of Austro-Hungary, and Judge Sepulveda of Mexico.

Although the programme is not yet finally made up, a large number of the papers or addresses are definitely promised. Ephraim Panning of 225 Dearborn street, Chicago, is chairman of the Committee on Organization.

George H. Ismon, New York sales agent of the Falcon Iron & Nail Company, has received from that mill, as samples of their stock, some very handsome Bessemer steel sheets, cold rolled. They include regular tinning sheets 14 x 20 inches, and sheets 14 x 28 inches 0.013 inch thick. The Falcon Iron & Nail Company make sheets to 29 and 30 gauge up to 30 inches wide and 96 inches long.

The Latrobe Steel Works deny the statement widely published that they had discharged 300 of their workmen.

Washburn & Moen Mfg. Company, Worcester, Mass., and New York, have been making deliveries since July 6 on their recent contract, obtained late in June, for insulated copper feeder cable. The Brooklyn City Railroad Company, by whom the order was given, are at present using it at the rate of about 10 miles a week for trolley purposes. The area or surface of a cross section is equal to  $\frac{1}{4}$  square inch. To execute this con-

tract will require about 2,000,000 pounds of copper cable, aggregating about 200 miles in length.

### Mesaba Mines.

The chief reliance of the newly formed Lake Superior Consolidated Iron Mines Company and the factor by which it expects to handle the Bessemer ore trade of the United States lies in its steam shovel mines. These are all properties from which ore of a high grade can be stripped of the earth above and mined by steam shovel. Of this class of properties the new consolidation has five, the Mountain Iron, Missabe Mountain, Biwabik, Adams and Lake Superior, all of which have been described at length in *The Iron Age* in the past year. Added to these is a possible sixth, explorations now being carried on in section 25, 58, 17, on lands of the Great Northern Company, indicating the presence of a probably large stripping mine. The new company have no iron mines outside the Mesaba range, and their claim that they can handle nine-tenths of the Bessemer output of this country is based solely on the ownership of these stripping mines, which can handle ore at a remarkably low price. Three records were made last week at three of these properties that are of no little significance in this connection. At the Missabe Mountain Captain Florada mined and loaded on cars in seven consecutive hours, working only one ordinary Barnhart steam shovel, 1500 tons of ore. At the Mountain Iron, in a trifle more than nine hours, 2500 tons were mined and loaded by one shovel. At the Biwabik, where circumstances were particularly favorable, 3400 tons were mined by one shovel in 12 hours.

The Biwabik is shipping two grades of ore—Biwabik and Mesabi Biwabik—one averaging above 65.50 iron and below 0.26 phosphorus, and the other about 62 and 0.035. Missabe Mountain and Mountain Iron average respectively a trifle below the better, and a trifle above the lower, of these two grades. It is not at all probable that ore of this quality was ever mined at such a cost as that above detailed, nor can it be, outside the Mesaba.

But if the new Rockefeller-Merritt syndicate believes it controls, which I doubt, all the stripping mines on the new range, present and to come, it is in a grievous error. Developments are already far enough along on three Mesaba properties, outside the combine, to warrant a belief that they belong in this favored class. One of these is the Iron King, in 17, 19 and 20-58-17, while the others have no names. There are also excellent opportunities in unprospected lands for large finds.

Daily developments at Duluth strengthen the opinions of those in a position to see, that an opposing combination of Mesaba interests under the control of the Minnesota Iron Company is being formed. There are abundant opportunities for one or two opposing syndicates, and a second, if ever formed, will have a good deal of Canadian Pacific Railway and Saginaw, Mich., capital back of it.

Matters in the Minnesota iron district are far more satisfactory than at the date of my last report. At the Biwabik, where stripping contracts were stopped two weeks ago because of tight money, they have begun again, and instead of 125 men and two or three steam shovels, the work will be all hand labor, employing nearly 300 men, all that reside in the vicinity. Steam shovel stripping was

not entirely satisfactory, because of boulders, &c., and the men are now working at low wages. Arrangements have been made for rapid mining at the Mountain Iron, and 3000 tons daily are being sent forward. The Hale has resumed and the Canton has begun again, shipping last week 2225 tons. Shipments over the Duluth ore docks last week were the largest yet, 40,000 tons, and Saturday 7000 tons were sent out. Shipments over the Two Harbors docks from the Vermillion range are also larger, 30,000 tons for the week, and the Minnesota Iron Company have put night crews on their stock piles and intimate that active mining will soon recommence. The Zenith Mine, at Ely, has also resumed shipping, and will get out 15,000 tons.

The Gogebic range shipped from Ashland 41,000 tons last week, and the three ranges mentioned have sent out for the year to date 1,700,000 tons.

**The Premier Steel Works.**—A dispatch from Indianapolis, dated September 12, says that Receiver McGettigan, in his report, declares that the mortgage to secure \$300,000 in 20 year 6 per cent. bonds was held until April, 1893, before being recorded, so that the company could obtain further loans in the meantime. He says the mortgage was fraudulent and should be set aside. The papers of the company show that H. E. Southwell of Chicago deposited \$100,000 worth of the bonds with the American Trust and Savings Bank of Chicago to secure six notes amounting to \$70,000, and that the remaining \$300,000 in bonds are held by C. W. Depauw to secure him for indorsing the company's paper. The receiver also says that the action of the directors in exchanging a large amount of capital stock for what is known as the "Adams patent" was illegal. The allegation is made that C. W. and N. T. Depauw controlled the Board of Directors, and in exchanging the patent for the stock they were dealing with themselves and should be held for the payment of the stock, amounting to about \$855,000.

A press dispatch from Elwood, Ind., under date of September 19, reports the business situation there as growing brighter. Among the works now running are McBert's mill, 750 hands; radiator factory, full capacity; tin-plate mill, full force and behind orders; bottle works of Nevison & Weiskopf, 200 hands; McCloy's chimney-glass factory, 500 hands. The plate-glass factory will start up on October 1 with 500 hands. The Akron Steam Forge Works are nearing completion, and the construction of the Raub Locomotive Works will begin in the next 30 days.

The large draw span of the Terminal Railway Company's bridge between Council Bluffs, Iowa, and Omaha was completed and turned in position on September 14. It is 520 feet long and exceeds in length anything of its kind in the world.

The General Freight Committee of the Central Traffic Association decided at Chicago last week that the special iron tariff should be canceled September 30, and that thereafter rates as per official classification should apply. A rate of \$2.10 on pig iron, carload lots, from Mancelona, Mich., to Springfield, Ohio, good until November 1, was authorized.



# HARDWARE.

## Condition of Trade.

THE SPECIAL REPORTS which we give below in regard to the condition of trade in the leading markets of the country will be of more than usual interest, and our readers will be glad to observe the general reference to the improvement in business. While trade has not assumed the usual volume, there is a fair degree of activity and a good many orders are being placed. While these orders are carefully assorted and cover only such goods as are demanded by the immediate requirements of business, their aggregate is considerable. It is noticeable that many of the jobbing houses are replenishing their stocks with a little more freedom than heretofore. There is, however, no evidence of a disposition to buy beyond the early requirements of trade, and merchants are still conducting their business very conservatively. Many more travelers are on the road than a few weeks ago, but there are not as many out as usual, most manufacturers and jobbers conducting their business with especial care and economy, and refraining from keeping on the road travelers whose business does not justify the expenditure. Advices from the retail trade indicate a perceptible improvement in business since the opening of the month, and it is pleasant to note that in many sections business is referred to as nearly if not quite as good as usual at this season. The extent to which building is affected by the recent financial troubles is illustrated in statistics which have recently been published relating to the building departments of New York and Brooklyn, which show that exceptionally few new buildings have been projected during the past two or three months. From July 8 to September 9, 1892, permits for 468 new buildings were issued in New York and 903 in Brooklyn, making a total of 1371, while during the present year, in the same period, the number of permits issued in New York was 290 and in Brooklyn 353, making a total of 648—a decline of more than 50 per cent. There has also been a marked decrease in the estimated cost

of the buildings projected. There has probably been a similar falling off in building enterprises in many other cities, and perhaps throughout the country at large, the effect of which on trade cannot fail to be felt. Manufacturers are availing themselves of the improvement in business and are pushing sales more vigorously than during the past two months, and their solicitude for business results in some cases in slightly lower quotations. Prices on the whole, however, are pretty well maintained. Collections show a very satisfactory improvement, and there is much less complaint on this score than a few weeks ago. The delay of action in the Senate in regard to the repeal of the Sherman law is having some disquieting effect in financial and mercantile circles, but it is hoped that under the pressure of public sentiment the repeal act may be passed without much further loss of time.

### Chicago.

(By Telegraph.)

The Shelf Hardware jobbers report a continued excellent demand for seasonable goods, which brings the volume of business up close to the usual fall trade. General Hardware, however, is moving out very slowly, and there is some apprehension that as soon as the trade in season goods it over there will be another period of dullness in this line. This view, however, is not entertained by all jobbers, some being hopeful that there will be good business up to the close of the year. The tinware houses report a better demand for goods of that character, but specialties in the dairy line are very quiet, owing to the bad condition of pastures. The Heavy Hardware trade is quite good in Iron and Steel, but not in other departments. The wagon and carriage builders are still buying very sparingly, and the outlook in that direction is not very encouraging. Manufacturers' agents have had a notable increase in their trade the past week. Collections are fair, very little complaint being heard on that score.

### St. Louis.

(By Telegraph.)

Continued improvement is reported by all the Hardware jobbers and collections are in better shape than at any time since the financial stringency first made its appearance. A lively demand for Wire Nails has set in and Barb Wire is also in good demand. A

number of good orders have been received from the Cherokee Strip. Builders' Hardware continues to be ordered freely, although there is no new building to speak of, and it is merely to finish up buildings now in course of construction that orders are received. Tin Plate, Sheet Iron, Bolts, Nuts, &c., are all in good demand. The situation shows general improvement and a steady trade is expected from now well on to the holidays.

### Cleveland.

THE W. BINGHAM COMPANY.—The improvement in trade, as compared with the past two months, is now unquestioned. Orders are more numerous than at any time since the panic set in. The total volume of business will necessarily fall short of the corresponding season for some time back, but, upon the whole, will not show such an immense falling off as the months of July and August would indicate. The only stumbling block apparently now in the way to returned prosperity is the settling of old scores. Collections are not what they should be, but with a little patience we think this difficulty will soon be overcome, and the Hardware trade will have passed through one of the most (if not the most) trying times it has ever been called upon to experience and come out with flying colors and a record to be proud of. Season goods are in good demand and with a fairish stability of price. Staples are firm.

### Boston.

BIGELOW & DOWSE.—New England was the last to feel the depression in business, and while its effect has not been so marked as in other sections, it is manifestly still with us, showing a falling off in sales and collections.

The sales of Shelf Hardware and Building Hardware show the greatest discrepancy, while the sale of Cut and Wire Nails has increased. Fall orders for Axes and Handles are as large as usual, and Cutlery also is selling in usual amount.

The Hardware trade are buying as they require the goods. There is no speculation and the indebtedness of the trade is growing less every day. There have been but few failures, and if the present policy of buying continues the trade indebtedness will be much less in January than for many years past.

The Iron and Hardware trade are bound by an agreement to charge cost for cases and carting on and after October 1. Other agreements of this kind have been made in the past, but have been easily broken up from a lack of organization and confidence in the trade.

Taking advantage of past experience and all acknowledging the justice of these charges, the trade have organized a New England Iron and Hardware Club, including all the jobbing houses of Portland; Providence New Haven

and Boston. The object of the club is to establish a better feeling and greater confidence in the trade.

Meetings are held each month, and already the results are becoming apparent in a better acquaintance, and with it a feeling of confidence in each other. From present appearance no honorable house would care to be the first to violate the case and carting agreement, either directly or indirectly, as each violation is to be carefully investigated by a committee of the club.

Other abuses may be remedied in time, but the prime object now is to have the trade more united and to create a feeling of good fellowship.

#### Louisville.

W. B. BELKNAP & CO.—Business is clearly on the mend. Orders are not only more frequent, but for larger quantities, indicating confidence in the situation and a reasonable expectation of being able to pay. While the Senate is pottering away the country is discounting its final action. We must believe that it will follow the noble precedent of the House and pass the repeal measure. If it should fail to do so we should be apt to see a repetition of the period of distrust and panic, and the papers would again be filled with news of suspended industries.

A rain longed for some 30 days or more has come finally to terminate in this territory a disastrous drought. Now, however, the cotton planters South say the wet is too great and damage from that source must be taken into account. At any rate, good prices are being and will be realized on agricultural products and the farmer continue to be solvent, while his city brother, often envied as the heir to superior fortune and advantages, is being tenderly cared for by the assignee.

The editorial in *The Iron Age* a week or two since on the competition of the receiver was most timely and should be thought over. Prolonged receiverships are a great abuse and a positive wrong to legitimate trade. To shuffle off legitimate debts as one might an old overcoat in springtime and take a fresh start, while the creditors are left to the full enjoyment of "that tired feeling," is an example too attractive not to prove contagious. It is like divorce in Chicago—"every facility offered"—and threatens to become as great an abuse now as the United States bankrupt proceedings were after the war. A comparatively short time to settle up should be given his honor the receiver.

#### Baltimore.

CARLIN & FULTON.—There has been a continued improvement in trade since our last letter, though the volume of business is far from being as great as it would have been had Congress after convening on August 8 acted promptly in responding to the appeals of the country, instead of engaging in a debate which is both profitless and interminable.

Because trade has resumed somewhat its normal condition, and money is beginning to lose its stringency, it is useless to argue that there need be no unconditional repeal and that matters will adjust themselves without any further legislation; such arguments, though offered, are fallacious, and the hopes of the free coinage Senators are based upon the belief that as time passes and the condi-

tions of trade improve the public will be blinded and forgetful of the lesson which has been taught, and the necessity which was apparent to all in the summer will disappear with the return of better times. We think it incumbent upon every one, in business and out, through the press, through personal influence, by public petition, and in every way conceivable to urge upon our Senators an acquiescence in the repeated demands of all the business interests of this country to vote at once upon the question at issue, and remove the possibility of a return to the position in which we were before the action of the House. What improvement has occurred has been the result of discounting the action of the Senate, for the people at large can hardly believe that when the vote is taken it can result in any other way than a repeal of the Sherman act.

Trade needs every stimulus that can be given it. Our wheat crop has been seriously curtailed and until recently the price was never so low. Cotton has advanced somewhat, but because of a diminished crop and not from an extraordinary demand. Rice was like other staples and naval stores shared in the same depression.

It is not the time to have any check to the onward movement which has just started; neither the manufacturer nor the consumer can afford it, and with a speedy adjournment of Congress it is but reasonable to believe that trade will increase from day to day, with a healthy demand from all sections based upon actual necessities and devoid of speculation.

#### Philadelphia.

##### SUPPLIEE HARDWARE COMPANY.—

We open this letter with the stereotyped information that no changes of importance have taken place in Hardware prices, and collections have not yet reached the satisfactory mark desired; in some instances, doubtless, caused by necessity, but in more cases we feel it is from a disposition to await results, and in other cases from the fact that a large number of customers through the country have either gone to or just returned from the World's Fair.

Unquestionably a larger number of merchants are at the World's Fair at the present time than at any time since its opening. It is well that as large a number of persons as can spare the time should make this trip. At the present time it is inexpensive, and they will find there a lesson which will never be forgotten.

Trade has developed into slightly improved conditions, and orders received, especially from the agricultural districts, are more frequent and embrace a larger line of goods than has been the case at any time since July 1.

We can see no reason why the agricultural districts should continue unreasonably depressed. Money is now freely offered for farm products, which are in great abundance. The fruit crop in our adjacent States is exceptionally large and bringing fair prices. The farmers in our own and adjacent States, as a rule, have been favored with good crops, and the price of wheat within the last three weeks has advanced 7 cents per bushel, which should be encouraging to the farmer.

It is an ascertained fact that the condition of the crops through certain portions of the South and West is quite as favorable as one year ago, and we have reports from certain sections

of the South that they look more favorable than for some years past.

Money is now freely offered for the marketing of these crops, and, with these conditions, why should lack of confidence continue in the agricultural districts?

Depression continues in the manufacturing districts, and workmen are compelled to draw upon accumulated savings made during the last four years of continued employment and high wages.

Passing through the Schuylkill Valley region a few days ago we could not but feel impressed. It is one of the most luxuriant, beautiful and fertile valleys the sun ever shone upon. The beautiful and picturesque Schuylkill River, bordered by overhanging trees, passes through this valley. Well-cultivated farms show the condition of the farmer. Well-built and painted homes stand surrounded by trees and well-filled barns hold the unsold production of the season. Orchards of fruit trees are seen on which hang golden and crimson fruit, and newly plowed fields show the inherited industry of the inhabitants.

Passing into the Lebanon Valley one sees every indication of prosperity and rivalry in the industry of the farmer. Semi-mountainous peaks border the line. These are covered with foliage. An occasional summer resort is picturesquely located. These are visited by tourists during the summer, who seek rest and recuperation from the invigorating breezes.

Penetrating these valleys, we find the farmers have experienced but little inconvenience, and none of the depression of their manufacturing neighbors.

A feeling of sadness, however, cannot be overcome as one passes through the manufacturing districts of the Schuylkill Valley.

We presume there is no manufacturing district in the country where the workmen have the advantages they have through the rural districts of Pennsylvania. The manufacturing towns are surrounded by agricultural and semi-mountainous beauty; living is inexpensive; many of the workmen own their own homes, and have for years enjoyed living in a manner with which the workmen in the crowded cities are unacquainted.

Leaving the suburbs of Philadelphia, we are sorry to say many large factories stand idle and deserted, which causes a feeling of sadness, which is increased as one penetrates further.

Passing Manayunk, one sees over 25 mills, embracing cotton, woolen, blanket and other industrial establishments, and scarcely any signs of life are seen around these establishments, and men stand idly around.

Reaching Conshohocken, where are located several very large iron mills and several textile industrial establishments, no signs of life are seen around these factories, and unless some of them resume at an early date suffering for the winter must be looked for.

Reaching Norristown, a large manufacturing city, scarcely a sound is heard coming from the various factories; no steam is seen issuing from the smoke stacks, and we were informed by a manufacturer there that but two factories were in operation.

In Royer's Ford some little activity was noticeable, but at Phoenixville a general quiet prevailed.

At Pottstown are located several large steel and iron mills. Some of these works have partially resumed, but the capacity in the town is large.

Reading (known to all the Hardware trade as a large manufacturing city we were prevented, from want of time, seeing thoroughly; but we were informed that many of the factories are closed, while some are working on one-third and some one-half time.

We find in many cases where factories have resumed the wages have been reduced from 10 to 15, and in some cases 20 per cent., which reduction employees cheerfully accept rather than remain in idleness with the coming winter staring them in the face.

No committee of investigation is suggested by Congress to ascertain why these factories dare close their doors, as was the case at the time of the stoppage of the Carnegie mills, and probably there would not be sufficient members in Congress to form the various committees.

An estimate, on good authority, places the unemployed September 1 at from 1,100,000 to 1,200,000 persons. When we take into consideration the popular vote of the last Presidential election, the above figures will show that a number equal to 10 per cent. of the entire vote cast for Harrison and Cleveland combined were out of employment, being a number equal to about 20 per cent. of the entire vote cast for President Cleveland, and yet the Senate remains inactive, and, from appearances, a vote will be reached at the low test of endurance.

It remains inactive as against the popular feeling and public sentiment of the country and against the appeals of 1300 commercial bodies.

Mr. Cleveland, believing money was worth all it was represented to be worth, enforced these views in his message. He was emphatic in his declaration that there was but one subject to be considered by Congress, but at the end of six weeks of extra session he finds the large administration element divided and the present situation of manufacturing industries appalling.

The body commercial is like the body physical. When disease overtakes either it requires treatment. First to properly diagnose the disease, then apply suitable remedies, but if the disease be allowed to run any great length of time other complications may arise and the entire system become involved.

One of the misfortunes of the age, and one of the greatest evils this country is called upon to endure, is partisan insincerity. No intelligent reader will conflict partisan with political.

A well-known Englishman, who had business relations in this country for many years, during which time he frequently visited here, remarked: "I am quite astounded at the fact that whatever one political party in your country proposes the other as vigorously opposes. In our country we have differences in opinions, especially on Home Rule, but we are united in one common cause which tends to the general prosperity of our country."

There has, however, been a recent exception to the above statement in the vote taken in the House of Representatives, where, without the votes of the opponents of the administration, free coinage, at the existing ratio of 16 to 1, would be carried, and paternalism to the extent of 50 per cent. would have been adopted.

It is remarkable and almost incredible that a large majority of the members of Congress, who strongly denounced paternalism, even to the extent of its being unconstitutional, when applied to the production of the manufacturer, the results of which largely inured to the benefit of the working class, favor a scheme of silver coinage which shows paternalism to the extent of over 25 per cent. on the ratio, and statistics show that in addition to that silver production above that shows a profit of about 25 per cent.

So when a foreign nation asks the question; "What is the value of an American dollar?" our present answer must necessarily be: A gold dollar

contains a sufficient amount of gold intrinsically worth its face value in all markets of the world; a silver dollar contains an amount of silver that would bring less than 60 cents as bullion, either in this country or in London.

In conclusion, would say, providing the Senate responds to the popular demand at an early date, we see no reason why trade may not gradually improve. There are a large number of persons employed, as the working force of all mercantile houses throughout the country (with rare exceptions) have thus far been retained and the salaries of these employees, as a rule, have not been reduced. Therefore, they are in the same condition financially as they were months ago. Retail merchants, therefore, find their trade from this element undiminished.

A very large amount of currency has been unlocked, and all the country requires now, so far as we can see, is the wheels of the manufacturing institutions to be put in operation.

#### New Orleans.

A. BALDWIN & Co.—Business is still very quiet in this section and there is very little improvement to note since our last report, although there is a brighter and more confident feeling in the anticipation of a much better business for the remaining months of this year. Crop movements have not assumed proportions large enough to bring buyers into the market. Jobbers are not increasing their present stocks, but are simply taking care of their every-day wants. We expect to see a decided improvement by October 1, and do not doubt but that the volume of business for this year will reach about the same proportions as last year, to judge by present indications.

#### Portland, Ore.

CORBETT, FAILING & ROBERTSON.—We cannot as yet report any improvement in the way of business. Some houses in the Hardware and other lines have withdrawn all their salesmen from the road. There seems to be, however, an undercurrent of better feeling now prevailing, as to what the immediate future has in store for us. Under ordinary circumstances, we should think that this Northwest territory had the best prospects ahead that it ever had. Crops of all kinds are away above the average; in fact, the yield in some sections has been phenomenal. Unseasonable weather for the past week has somewhat delayed harvesting, but as yet no serious damage has resulted. Should there be any marked improvement in the price of wheat for export there would be more confidence expressed at once.

#### Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—It is not to be expected that trade can in a day awake from the torpor of the past two months and suddenly assume new life and activity. All that can be hoped for is a gradual improvement until the volume of business shall have reached the normal condition. Two weeks ago it was noted that a slight reaction for the better was in progress, and since that time a gradual and steady improvement has developed, lending a decidedly encouraging aspect to the business situation. No obstacles now appear to be in the way of a reasonably fair trade for the remainder of the year.

The harvest is generally over, and although the returns do not show a full

crop, still it is reported very far from a failure.

#### San Francisco.

HUNTINGTON HOPKINS COMPANY.—There is very little, if any, change in the condition of things since our last report. On account of the low prices of grain and fruit, our leading products, there is so little profit to the producers that they are confining their purchases, as a rule, to the bare necessities, and trade is still very dull in consequence. Collections are also poor for the same reason.

Locally there is very little doing, especially in building. We are anticipating, however, that with the advent of our midwinter fair business of all kinds will materially improve.

There is a good prospect that one of California's old time industries will soon be booming, as the board of Engineers appointed by the general Government have already granted a license to one of the hydraulic mines to begin operation. Should the mining companies so build their restraining dams as to hold the debris and meet with the approval of this board, there is apparently no reason why they should not operate. This would repopulate a large district that has been almost entirely deserted for many years.

#### Notes on Prices.

Wire Nails.—There has been a good degree of activity in the Wire Nail market and most of the mills are well occupied on orders. Their business has been for the most part in lots of moderate size, there not being a disposition on the part of the largest purchasers to order more Nails than are sure to be required in the near future. The buying is thus limited to the necessities of the trade and an entire absence of speculative spirit is noticeable. There is some unevenness in prices and the market gives indications of weakness. Some of the manufacturers are disposed to hold pretty firmly to the quotation of \$1.50, but the greater part of the business has been at lower figures. As a general quotation \$1.45 to \$1.50 may be named for ordinary lots, but the lower figure is shaded under pressure. Small lots from store in New York are quoted at \$1.60 to \$1.65.

Chicago, by Telegraph.—Wire Nails are weaker from factory, notwithstanding a better demand. Plenty of orders are being booked, but by those who are making the lowest prices. The manufacturers are now selling lots of 400 or 500 kegs at the price they would ordinarily ask for very large quantities. Quotations from factory are in the neighborhood of \$1.45, Chicago, but this is shaded to the best trade. Jobbers continue to quote small lots at \$1.50 to \$1.60, but their prices are not so firm as they have been.

Cut Nails.—The Cut Nail market, on the whole, is devoid of specially new features, and there is but little improvement in the demand to report. Transactions are limited to the immediate requirements of the trade. Prices also continue without material change,

but there is, perhaps, an undertone of weakness perceptible, and it is not unlikely that an attractive order for prompt cash could be placed at low figures. Small lots from store in New York are held at \$1.25 to \$1.30.

*Chicago, by Telegraph.*—Business in Cut Steel Nails is improving steadily, and September will show a much better trade for manufacturers than August. Inquiries are being received from a little wider territory now than last week, showing that the improvement is covering a larger field. Prices are unchanged, factory lots being quoted at \$1.20 @ \$1.25, Chicago and small lots from stock, \$1.30.

**Barb Wire.**—An increase in inquiries for Barb Wire is reported and also some improvement in the demand. The market is in substantially the same condition as regards price, and quotations are on the basis of \$2.40 to \$2.45, for carload lots at mill of Four Point Galvanized. It is understood that these figures are slightly shaded in special cases.

*Chicago, by Telegraph.*—Manufacturers of Barb Wire report a fair demand, which is perhaps a trifle larger than a week ago, with indications of further improvement. Jobbers are also having a better trade from all parts of the territory reached from this center. Factory lots are quoted on the basis of \$2.45 to \$2.50 for Galvanized and small lots from stock \$2.60.

**Sheet Zinc.**—Under date September 12 Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue another price-list and discount sheet of Sheet Zinc, quoting the advanced price of \$4.25 per 100 pounds is announced for Sheet Zinc in 600-pound casks, of the thickness between Nos. 9 and 15, inclusive, and of the widths between 32 and 46 inches, and of the lengths between 84 and 90 inches.

They also announce the following revised extras, in cents per 100 pounds:

	Nos.	5	6	7	8	9	10	11	12	13	14	15
32 to 40	x 84	35	20	15	05	.....	.....	.....	.....	.....	.....	.....
32 to 46	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
46 to 52	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
52 to 58	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
58 to 64	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
64 to 70	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
70 to 76	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
76 to 82	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
82 to 88	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
88 to 94	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
94 to 100	x 84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

The extra on No. 4 36 x 84 is \$0.60 per hundred pounds.

The charges for small lots and the discounts are the same as announced in the circular referred to in our last issue.

**Bradley's Shelf Brackets**—The Atlas Mfg. Company have added a 10 x 12 inch size to their line of Steel Shelf Brackets. The list of this size is \$6 a pair, subject to a discount of 70 and 10 per cent. They also advise us that they

are putting heavier wire and steel into the goods than heretofore.

**Cordage.**—A fair but not heavy business in Cordage is reported. Stocks in the hands of many dealers are low, as a result of the condition of things in mercantile and financial circles for the past few months. More inquiry and an increase in business is, however, reported. Prices continue without change and with perhaps a slightly weaker tone, which does not, however, call for a change in quotations, which are on the following basis:

	Base.
Manila.....	\$0.03
Sisal.....	.06½
New Zealand.....	.06¾

The above figures are for large lots at factory or New York. On smaller lots, such as are usually purchased by the trade, slight advances are made.

**Glass.**—There is an improvement noticed in the Glass trade, demand being somewhat greater and prices firmer. This is the season for placing orders for Glass, and with no home production and a limited quantity of imported Glass coming into the country, stocks are not as well assorted as could be wished. There is no immediate prospect of American factories going into operation. Indiana and Kentucky have been declared by the National Window Glass Company an open market, as manufacturers in these States felt they were not getting their share of the trade. It is stated in this connection that these manufacturers have disposed of their best Glass, so that this departure is not likely to affect the price of Glass in other hands. Some of the Plate Glass factories have gone into operation to replenish their depleted stocks. Prices remain unchanged on all lines of Glass.

THE RECEIVERS OF WALLACE & SONS, Ansonia, Conn., and 29 Chambers street, New York, have issued an announcement to the trade, referring

## The Boston Iron and Hardware Club.

A MEETING of the Boston Iron & Hardware Club was held Tuesday, September 12, at the Algonquin Club. Several prominent gentlemen from Portland and Providence were admitted to membership. The business meeting was followed by a dinner, and the occasion is referred to as having been very enjoyable and successful.

The agreement recently entered into by the leading Hardware houses of Boston, Providence and Portland in regard to making cartage charges goes into effect October 1. The reason for this action is explained as follows in a circular which has been issued to the trade:

In consequence of the close competition prevalent at the present time, the margin of profit in our business has become so small that matters comparatively unimportant in better times have now to be seriously considered; such are the items of cartage and packages. These are expenses which it is proper the purchaser should pay, and, in accordance with the custom prevail in nearly all other lines of business, and in our own business in all large centers, we will, on and after October 1, make a reasonable charge for cartage on all invoices whereon cartage is incurred, and will charge boxes, cases and other packages at cost.

The club have also established a bureau of information and credit, which it is expected will be of material assistance in collecting from delinquent debtors.

## Question in Regard to Collections.

FROM a house who are known as prominent retailers we are in receipt of the following inquiry in regard to the course to be pursued in the circumstances alluded to. Our correspondents advise us that in conferring with other merchants they find their experience in the matter is not unusual, and they are desirous of obtaining from some of the older houses in the trade advices in regard to their manner of handling cases like the following:

Here is a large manufacturing concern, employing some 300 hands. They never buy anything of us unless we sell them cheaper than any one else, or unless we are the only concern in town that have the goods.

Besides, they invariably take their own time in which to pay for what they do buy. When the account is due they say what practically amounts to the following: "It is a matter of no consequence whatever when we pay you. When it entirely suits our convenience we will send you a check. You ought to be thankful for what trade we do give you." Now, fellow merchants, what do you with such folks?

GRINDSTONE.

AMONG the special notices in this issue will be found one announcing the offering for sale of the Hardware business carried on by the late Charles P. Strong at New Brunswick, N. J., in order to close out his estate. This business is referred to as having been established over 65 years.

## Organization Among Retailers.

**A**S WE GO TO PRESS the meeting of Hardware retailers is in session in Chicago, considering what can be done in the way of organization for the mitigation or removal of the evils under which the trade are suffering. The especial grievance of which the retailers complain is the encroachment of manufacturers and jobbers on their trade, as well as the increasingly large place which is being taken by department stores, Grange and Farmers' Alliance houses and similar establishments. There are obviously other matters which might appropriately be touched upon or regulated by agreement among Hardware merchants and the whole question as to what can be accomplished by organization and concerted action is deserving the best attention of the trade. As discussing the matter somewhat fully, and from the standpoint of an enterprising and successful retail house, the article entitled "National Association of Hardware Merchants" will repay perusal. The following letter, also from a Hardwareman of experience and ability, will be of interest as discussing the question briefly and forcibly:

There seems to be no doubt in the minds of those who have been consulted regarding the formation of a National Retail Hardware Association that it would promote a friendly fraternal exchange of business ideas, that it would remove jealous competition, that it would prescribe for feelings of envy a more comprehensive idea of business principles, that it would have a tendency to make prices more uniform among local dealers, that it would bring together the brightest Hardwaremen in the country, whose sound judgment and good advice could not help raising to a higher place the standard of the retail Hardware trade. We need all of this, and we think it is a step in the right direction. That our territory has been encroached upon none will attempt to deny, and we think a mild defense would be better than open warfare, so would protect ourselves by modest resolutions and pledges.

We have no desire to boycott, but we hope to have it distinctly understood that manufacturers and jobbers cannot sell both the consumer and legitimate Hardware trade. That they have a legal right to do so we do not question, but we will make a combined effort to protect ourselves from such poachers by the formation of a National Retail Hardware Association. The middleman—the jobber—should take warning lest he fall some day by the wayside, a crippled peddler.

Doubtless at the meeting in Chicago, September 20, there will be a fair representation of retail Hardware merchants from many, if not all, of the States, and they will form a National Retail Hardware Association; elect officers, form a constitution, adopt by-laws, appoint the various committees, and in all probability divide the States represented into districts, each district to have as many local organizations as is necessary to promote the healthy growth of the association.

The president of the local organization should be located within easy call of any of its members, so that matters of business could be attended to at a

slight expense. All local organizations should be held responsible to the parent association for the proper observance of all its by-laws. All matters of business that could not be satisfactorily settled by the local president should be handed up to the parent association, and its decision should be final. A complete set of instructions from the parent association should be in the hands of the local president, and such should be complied with before the business passes up to the association. Complaints against manufacturers or jobbers should only be made when the most positive proof is presented and then a promise never to do so again should put the guilty party on the poachers' list for, say, three months, and at the end of that time, if he has kept his promise, he should be taken out of the poachers' list and be allowed to take his place in the ranks with honorable men. Hasty action, decisions without due consideration, would lead to bad results.

It is to be hoped that the association (if formed) will make the membership fee low and the yearly dues not to exceed \$2. Many merchants do not know the strength of organization and would be loth to join if much expense is attached to it.

## National Association of Hardware Merchants.

BY ILLINOIS.

**T**HE FACT of an effort now being made to form a national association among the retail Hardware merchants of the United States has prompted me to submit my views on associations of merchants, in answer to the invitation in your issue of August 24. I will treat of a national association in preference to local associations, as the greater embraces the lesser and the best results will ensue therefrom.

Is it desirable to have such an association? How may it be organized? What should be its object and what benefits should result? These are, in brief, the questions I shall endeavor to answer, from the point of view of one whose experience covers 22 years in the Builders' Hardware business.

### NEED OF ORGANIZATION.

Experience and observation prove that associations of men formed for the purpose of enforcing a recognition of their rights, or for the advancement of their interests, on the lines of a just recognition of the rights of others, if intelligently managed, are generally sure of success. That the retail Hardware merchants of this country are in need of an organization to protect their interests and defend them from the attacks of too selfish friends is evident to any one who has industriously labored to build up a retail Hardware trade in a community where owners, architects and contractors are among his customers and buildings of the better class are erected. It would be difficult, if not well-nigh impossible, to find in any city or town of moderate size in this country a retail Hardware merchant who does not annually suffer loss of trade from the encroachments of some manufacturer

or jobber, who goes to the consumer and offers his goods with the alluring statement that the customer is getting lower prices because he is dealing direct; who afterward excuses his action to the retail merchant on the ground that he was fearful some other manufacturer or jobber might have secured the order, or because the dealer was not in a position to handle so large an order, or that he as obliged to do it to advertise his goods on that particular building, or if, perchance, he had no customer among the trade, he adopted that course to oblige some one among them to buy his goods, all the excuses being formed by a judgment warped by the sight of the mighty dollar.

### RETAILER AS DISTRIBUTOR.

Both the jobber and manufacturer owe their prosperity to the retailer, for without his assistance neither of them could profitably dispose of his goods. His countless stores are always open and ready to supply the thousands of customers whom his industry has made, though, unfortunately, he is, at the same time, indiscreetly advertising the wares of some favorite manufacturer or jobber, who is ever on the alert to grasp the few rich prizes that may chance to be offered him. Self-interest is the motive that prompts all alike, the manufacturer, the jobber, the retailer; but the golden rule should be their guide, for no business can prosper that is not conducted without a due regard to the rights of both buyer and seller; it may flourish for a time, but the experience of the mercantile world, evidenced by the countless commercial wrecks that strewn its shores, proves that it possesses inherent elements of weakness that, sooner or later, will bring disaster.

### ARTISTIC HARDWARE.

In this, the renaissance period of Builders' Hardware, does not every reflecting Builders' Hardwareman know from experience that the fine Hardware of to-day is directly due to the efforts of the leading retailers and their never-ceasing complaints of poorly made and carelessly finished good, and to their oft reiterated requests for improvement? They have besieged the architect for special designs of artistic merit for fine buildings, that were afterwards sent to the manufacturer for execution and when produced had to be inspected and criticised, not at the factory, as they should have been, but by the expert Hardwareman, who at long range and under many difficulties had to tell the manufacturer what changes were necessary and, not infrequently, how to make them, very often to the disgust of the manufacturer, as in an instance where the president of a factory that makes a specialty of fine Hardware remarked, when a large lot of goods were returned as defective: "If nothing was said about this defect the architect and owners would accept the goods." The answer was that "Neither the



architect nor owners recognized any special make of goods and certainly none that were above criticism and examination; that the firm were responsible for the standard and quality required, and that what they approved they were confident would be accepted."

#### RETAILERS' KNOWLEDGE.

The standard for the retail Hardware man who aspires to rise above mediocrity should be: honesty, intelligence, industry, a thorough and comprehensive acquaintance with all the details of his business, and the knowledge not only of his goods, but how to correctly use and apply them; Let him take a position of manly independence and solicit orders on account of his superior knowledge of his business, the excellence of his goods and the possession of an experience that teaches him how to use the same goods to better advantage than any manufacturer or jobber possibly can use them, and not ask any one to purchase goods because they are made by any particular firm, who, as soon as their reputation is established, will use your name and work to sell their goods direct to your customers, safe in their confidence that alone and unaided you cannot oppose them successfully. Why should we hesitate to resist these rapidly increasing encroachments, and inform our customers when they ask "On whose goods are you figuring?" that our estimate contemplates the goods from no one factory exclusively, but selections from a large number, experience having taught us that from no single manufacturer can a complete line of the finest goods be secured, the best results being obtainable only by a judicious selection from among several; that we guarantee the quality and fitness of our goods for his purposes, but that as conditions in buildings are constantly changing we may find it necessary to substitute goods of a different kind and make from those we now intend using; that each building must be considered distinct from any other; that in Hardware, as in medicine, we must adopt the practice of the intelligent physician, who does not prescribe the same medicine invariably for the same disease, but treats each case on its particular merits.

#### MANUFACTURERS AND JOBBERS.

You can demonstrate to your customer that no manufacturer nor jobber is able to furnish a building in a satisfactory manner, they having but one line of goods from which to make a selection, and lack the practical experience in the use and application of goods that is absolutely necessary in trimming buildings. The goods are received by the owner without any competent man to direct their distribution, and in consequence numerous mistakes and errors that are inseparable under such conditions are added to the graver ones made by the manufacturer or jobber, who possesses no practical knowledge of the requirements. The result is annoyance and

frequent exchange of goods, and an expense greater than if the order had been intrusted to the retail merchant, to make no mention of the use of goods not adapted for the building. If your customer has confidence in your judgment, honesty and ability you will in most cases secure the order, my experience having proven that more contracts are awarded upon confidence than upon low prices, a fact that many merchants overlook. Our entire system of finance and trade is built upon confidence, and why should this essential element be lacking when the purchase of a bill of Hardware is to be made? Why should the buyer act as if he believed the Hardwareman's object was to deceive him? By what right does he call on the firm that in his judgment is the best, and after securing from them advice and opinions that have cost them years to acquire, carry it to some competitor who is willing to use the knowledge thus gained and sell the goods at an apparently lower price? Would any one presume to consult a professional man in the same manner and not expect to pay dearly for his temerity? The action of the manufacturer or jobber in selling direct to the consumer is questioned upon the broad ground of common fairness. Is it just that they should solicit the retail merchant's trade with the tacit understanding that their business was to sell to the trade alone and not consumers, and then prove false to these unwritten agreements, and is it right that the retailer should continue to buy of those firms that thus break faith with him and deprive him of trade that legitimately belongs to him? In my judgment it rests with the dealer to correct the already too prevalent and rapidly-growing evil by an observance of the suggestions just made, as they would prevail on the manufacturer and jobber to recognize the necessity of being consistent with their professions to sell to dealers only.

#### ORGANIZATION.

To form an organization of retail Hardware merchants that will prove effective it should be national in its character and include in its membership all merchants of good standing in the principal cities and towns in the United States; otherwise, concerted action powerful enough to command attention and respect would be impossible, as the vacancies caused by the absence of a number of prominent firms might tempt some members to falter in their allegiance. I would suggest the formation of local associations in each State, they to select delegates to represent them in the national association, the number to be governed by the aggregate of dealers in the local associations. To accomplish this, the meeting in Chicago might appoint a committee to solicit members to join, and when, in their judgment, a sufficient number have signified their willingness to become members, assess each firm a certain sum to meet expenses, after which select some capa-

ble man, at a fair salary, to correspond with the dealers throughout the country and form the various local associations. When this is accomplished, a meeting of the national association could be called and a constitution and by-laws adopted and all necessary details arranged to carry out the objects of the association.

Advertisements calling attention to the proposed organizations might be inserted in all the Hardware trade papers and the editors requested to notice them editorially; as their most numerous body of subscribers is to be found among the retailers, they will undoubtedly give the requisite space in their columns.

#### OBJECTS OF THE ORGANIZATION.

The object of the association should be, primarily, to take such action as may seem proper to induce the manufacturers and jobbers to confine their sales exclusively to dealers. As a natural sequence to the meetings of the association, a free exchange of opinions upon a matter so full of vital interest would occur, better and pleasanter acquaintances would be formed, a spirit of good fellowship created and, incidentally, a correction of many minor evils or annoyances that now cause unnecessary friction in the business life of the retail Hardware merchant. A specific mention of these matters does not seem necessary here, as they must be largely governed by circumstances and environments, and their regulation could safely be left to the wisdom and discretion of the various local associations.

#### REGULATING PRICES.

Great care, however, must be taken to avoid any attempt to regulate prices, for upon this fatal rock associations of much greater pretence have inevitably split. Upon one side lies the Scylla of temptation to cut prices for fear your competitor might be unduly tempted and you would thereby lose a sale, and on the other the Charybdis of public opinion, either one of which will inevitably cause disorganization and disruption. Let the association learn wisdom from the failure of others and wisely court approval at the bar of public opinion, which ever approves and encourages a legitimate effort to correct actual abuses and frowns upon all attempts to artificially increase or regulate prices. The laws of trade are as inexorable as fate, supply and demand must govern prices, and if these truths are accepted, retail Hardware merchants will in time occupy a higher position in the commercial world than they at present fill. The strong bond of self-interest found in such an association will serve to strengthen it, increase its membership and perpetuate the organization.

I know that some will disagree with me on the question of the regulation of prices and argue from a chimerical hope of increasing their profits, that if all were agreed, prices could be maintained; in answer, I have only to ask, has any merchant ever known a com-



bination that was not broken many times, that even when the cuts were known and for policy's sake condoned for a time, did not finally result in a split that swept away more than the profits that had been made; and who that buys combination goods does not know, by experience, that they are less profitable than goods bought when no trust or combination exists? If such is your experience, is it wise to credit your customers with less business acumen and discrimination? "Competition is the life of trade" and the death of trusts, and however much we may individually regret it, history and experience daily emphasize its truth.

#### SUCCESS.

An association formed and conducted upon the lines indicated would prove of incalculable benefit to every retail Hardware merchant; it would in time eliminate all illegitimate competition, for I cannot but believe that every manufacturer and jobber would eventually recognize the justice of our demands, and the comparatively few who now offend and play the part of Mr. Hyde when our face is turned and Dr. Jekyll when offering their goods to us will, from a selfish, if no higher motive, join the ranks of the great majority of manufacturers and jobbers who recognize the retailer as their best friend and encourage and aid him to secure all the trade that really belongs to him. If the dealers who are to meet during this month will act in harmony and concert and keep solely in view the one purpose for which they are gathered together, I am confident that the nucleus of an organization will be formed that in time will embrace all retail Hardware dealers and result in the correction of the chief abuses from which we suffer and eventually result in adding materially and legitimately to the profits of those who have labored much and harvested little, and aid in improving and elevating the standard of a class of merchants that is burdened with a mass of petty detail from which nearly all other lines of business are free.

#### Freezers.

**A**NNOUNCEMENT is made by the Shepard Hardware Company, Buffalo, N. Y., that they have sold and transferred to North Bros. Mfg. Company, Philadelphia, their Ice Cream Freezer business, including patterns, trade-marks, &c., and all orders for Freezers of the kinds formerly made by them, as well as repairs for the same, should be sent to the latter concern. North Brothers Mfg. Company state that they will be ready to furnish the full line of Lightning Freezers by December 1 next, and probably earlier than that date. In the manufacture of the goods the company will maintain the high standard of materials and workmanship which has distinguished these Freezers in the past. With this addition to their line the North Bros. Mfg. Company will undoubtedly occupy a conspicuous

position as one of the leading manufacturers of Ice Cream Freezers in the country.

#### Seventy-fifth Anniversary.

**W**EED & CO. of Buffalo, N. Y., are well known to the trade as a large, enterprising and successful house, but comparatively few of our readers are aware of the length of time that they have been engaged in business. On Saturday, September 23, they will, however, celebrate their seventy-fifth anniversary. We give herewith a reproduction of a card of September 23, 1818, which will be of more than passing interest, as giving a glimpse of the very different condition of things prevailing in the Hardware trade at that time from those which are characteristic of it at the present day. In connection with this

tend their congratulations at the approaching anniversary, and the house will enter upon the remaining quarter of their first century with the best wishes of a host of friends.

#### Report from Charleston.

**W**E ARE INDEBTED to Marshall, Wescoat & Co., Charleston, S. C., for the following interesting and comprehensive report in regard to the condition of trade in their territory:

*Business in General.*—Business has not been as large as was expected, but better, not only in character but in profits. The necessary caution exercised after February reduced volume and improved class of trade sold.

*Condition of Hardware Business.*—The Hardware business was less affected than any other branch, values fluctuated less and demand was steadier. At times a scarcity of certain

## Hardware, Ironmongery, &c.

### G. & T. WEED,

**H**AVE lately opened at the STORE next below Messrs. TOWNSEND & Corr, a very general and extensive assortment of

**HARDWARE, CUTLERY, SADDLERY, CABINET WARES & IRONMONGERY,**

Principally of their own Importation, which will be sold unusually low, by WHOLESALE or RETAIL. A constant supply of

*Dutch Bolting Cloths, Bench & Moulding Planes.*

As Agents to the Manufactory at Albany, they offer for sale, SCREWS, TUBS and ROLLERS for Oil-Mills, SCREWS for Paper-Mills, ditto for raising Mill-Stones and for various other uses, made to any order—CHURCH CLOCKS, &c. &c.

BUFFALO, September 23, 1818.

D. M. DAY, Pr.

*Weed & Co.'s Seventy-fifth Anniversary.*

approaching anniversary Weed & Co. have issued the following appropriate announcement:

Seventy-five years is a long time for any business to continue at the same stand. The Hardware business of Weed & Co. is probably the only instance on record in Buffalo. Weed's Hardware store was established in 1818, at the corner of Main and Swan streets, and three buildings successively have been occupied, all on the same street corner.

The Hardware business was founded by George and Thaddeus Weed, and continued under this and other partnerships until 1851, when Dewitt C. Weed became proprietor. The present firm of Weed & Co. is composed of Hobart Weed and James R. Smith.

When this Hardware store was opened by G. and T. Weed, with a card to the public, Buffalo had a population of less than 2000. On the day that we invite our friends to celebrate with us the seventy-fifth anniversary of our birth, it is estimated that Buffalo's population has increased 160 fold. We sincerely hope that our patrons will agree that our stock, our custom and our facilities have increased commensurately.

Many of the friends of Weed & Co. will doubtless find it a pleasure to ex-

goods was apparent and the extreme cold weather delayed shipments from factories. Agricultural Implements were in great demand and spring orders were large. Naturally very little else is sold at this season, but the sales of Shelf Hardware and household goods unusually large, showing that fall purchases had fallen short of demand.

*Stocks of Hardware.*—Stocks are full and well assorted, but cannot be deemed large. A feeling of uncertainty prevented acceptance of many tempting offers, and the disposition was rather to lose a profit than even risk a prospective loss. Any marked increase in business will make perceptible breaks and necessitate prompt replenishing.

*Tone of the Market as Regards Prices.*—We anticipate a gradual and steady increase in values, and are satisfied that orders could not now be placed on terms as favorable as were offered 30 days ago, and within the next 30 days some difficulty will be experienced in being supplied at all.

*Prospects for Trade During the Next few Months.*—We are certain that as soon as the harvest is gathered there will be a large increase in business, which will probably reach the largest ever done in this section. Interior traders have been almost niggardly in their fall purchase, and are running stocks

lower than ever before, waiting for the harvest.

**Prospects for Building.**—The recent disastrous storm, which swept fully one-third of South Carolina and Georgia, destroyed numberless houses, barns, gin houses, stables and other necessary buildings, alike on farm and in cities, and there must of necessity be an immense amount of building and repairing done, requiring an unusual amount of Builders' Hardware alone, and this, added to the legitimate demand, will add largely to the volume of business now doing and to be done.

**Agricultural Conditions.**—We regard the general farming interests of the trade as in better condition now than for several years past. Some sections of Carolina and Georgia were seriously injured by the storm, and trade in that special territory will for the present be absolutely nothing. But the area is too large and too valuable to be abandoned, and will soon be preparing to gather what remains and arranging for future production. The upper and middle sections of both States are especially prosperous and will give a good record in the near future.

**Collections.**—Collections have been variable, almost spasmodic, but upon the whole reasonably fair. For days nothing would be received and anxiety created, but before reaching despair a little relief would come and in small amounts continue sufficiently long to relieve anxious care. From this time we expect to receive not only what current business would bring, but a good portion of what has been withheld or delayed.

**Traveling Salesmen Reports.**—All of our travelers report prospects for a large trade later on as being unusually good, and are already in receipt of requests to call from customers who either deferred purchasing until the season advanced or simply bought sufficient to supply immediate wants.

**Manufacturers and Jobbers.**—We trust that manufacturers will cease the useless war now being waged against each other, cutting prices, which means loss to themselves and a profitless business to others. That they will refrain from invasion of the legitimate territory of jobbers who have their own special burdens to bear, and should not have additional ones in the form of daily quotations from unwise manufacturers who have overproduced, and are seeking outlets for such overproduction, to the annoyance and positive loss of the hapless jobber who places his orders with the manufacturer six months in advance, and is now confronted by personal or circular quotations sent to the very trade for whom the orders were originally given. Our experience in the past warns us that complaint is vain, but under the circumstances it is a relief to make it.

## Aluminum in Bicycles.

**THE EAGLE BICYCLE MFG. COMPANY** of Torrington, Conn., make a specialty of light-weight road Bicycles, in which aluminum is used in the rims. The rims are referred to by the manufacturers as being made under special process, and as not only standing a vast amount of rough usage on the road by strong riders, but as being superior to hollow or crescent steel rims. In case of a collision or indentation of the rim, it is stated that the aluminum is easily brought back into place, rideable as before, thus avoiding the necessity of new rims, as with the ordinary wheel under the same circumstances. The manufacturers make the point that the rim of reduced weight—the revolving portion of a Bicycle, and at a point

so far distant from its axis—produces lightness of running in a Bicycle to a greater extent than several times that amount reduced from frame or handle bar parts. As a result of this construction it is claimed that less propelling power is required, and a quick increase of speed can be obtained by a rider with less muscular exertion. This company have also experimented with complete aluminum frames, but they advise us they are not ready to supersede their ordinary steel tube frames with cast aluminum, though their experiments have proven fairly successful.

## Trade Items.

**SURPLESS, DUNN & ALDER**, 97 Chambers street, New York, have about finished arranging a showcase of Padlocks, &c., made by E. T. Fraim, Keystone Lock Works, Lancaster, Pa., for whom they are agents. The interior surface, having an area of  $3\frac{1}{2} \times 4\frac{1}{2}$  feet, is covered with electric blue silk plush. The lines shown embrace Jail and Scandinavian Locks in brass and iron of several finishes, Padlocks in bronze, brass, all steel and malleable iron, Bicycle and Bag Locks in brass, plain and nickeled. The keys are ingeniously held firmly in place, although easily removed, by pieces of nickeled coil spring, cut about an inch long, and fastened at each end with a brass head upholsterers' wire nail. The case is of black walnut, with a suitable inscription above, giving name of manufacturer and agents in gold letters.

**THE AKRON TOOL COMPANY** advise us that an order has been placed with them by a railroad company for 30 1-ton capacity McNeil patent balanced automatic dump Charging Barrows for the coaling stations on their line. As an evidence of the efficiency of these Barrows a customer of the company states that he can furnish an engine 4 tons of coal in three minutes, counting from the time the engine is stopped until the apron is returned to its proper position.

**GIBBS MFG. COMPANY**, Canton, Ohio, advise us that among the new goods that they shall put upon the market the coming season for the first time will be an all-steel Lawn Rake, which they have named the Hustler.

**HENRY WOHR**, 125-127 Worth street, New York, calls attention to the Hong Kong Razor, a brand handled exclusively by him. The Razors are of silver steel, all hand forged, and while used by barbers are recommended for private use. A recent importation of 12 gross of these Razors is now at the custom house.

**THE ENTIRE PLANT** of the Nashua Butt & Hardware Company of Nashua, N. H., has been purchased by the Reading Hardware Company of Reading, Pa.

**THE HARDWARE, STOVE AND TINWARE STOCK** of Rensch & Coffey, Madison, S. Dak., has been purchased by McDonald Brothers. The retiring firm had a fine business at the time the sale was made, and McDonald Brothers have good prospects of success in their new venture.

**PATTERSON, GOTTFRIED & HUNTER**, dealers in Machinery, Metals, Hardware, Tools and supplies, 146 to 150 Centre street, New York, recently sent out attractive samples of Wire Cloth with all their letters without regard to how many any one house might receive. One of their correspondents, who received 25 of these samples, finally wrote calling attention to the

seeming extravagance, which he felt was due to carelessness in clerks and not known to the principals. Mr. Patterson replied that the samples were furnished without charge by the manufacturer, while their portion of the expense did not exceed  $\frac{1}{2}$  cent each. Therefore the 25 sample packages had cost them  $12\frac{1}{2}$  cents in all, adding: "You no doubt now are well aware we keep Wire Cloth, and are not likely to forget. Having accomplished this result for so little, we consider our method has been judicious, well-planned and economical." In the judgment of this enterprising house, advertising to be profitable must be kept continually before those it is intended to influence.

**ATTENTION IS DIRECTED** to the advertisement of the Rogers & Hamilton Company of Waterbury, Conn., in this issue, showing the Majestic design which was patented August 20, 1893. In connection with their silver-plated Flat Ware the manufacturers lay great stress upon their manner of packing all fancy pieces; Ice-Cream, Orange and Berry Spoons, Fish Forks, Pie, Fish and Crumb Knives, Ladles, &c., being packed in fancy-lined boxes, making them especially attractive to retail purchasers. The parts of their goods most exposed to wear are sectional plated, while the boldness of designs is referred to by the manufacturers as somewhat approaching sterling silver in style.

**C. L. MUNGER**, agent, successor to H. H. & C. L. Munger, 142 Lake street, Chicago, now represents among others the following manufacturers of Hardware Specialties, carrying stocks for them:

Syracuse Twist Drill Company, Syracuse, N. Y. Samson Cordage Works, Boston, Mass. Ausable Horse Nail Company, New York. Phoenix Caster Company, Indianapolis. Judson L. Thomson Mfg. Company, Waltham, Mass. E. H. Titchener & Co., Binghamton, N. Y. Batavia Carriage Wheel Company, Batavia, N. Y. Franklin Mfg. Company, Rochester, N. Y. S. Cheney & Son, Manlius, N. Y. Decker Mfg. Company, Keokuk, Iowa. James Russell Barrett Company, Syracuse, N. Y. Horace E. Britton, Stoughton, Mass.

## Meriden Cutlery Company's New Goods.

**MERIDEN CUTLERY COMPANY**, 80 Chambers street, New York, and Meriden Conn., have prepared for the fall trade and have now in stock and on exhibit a large line of new and attractive goods in Table Ware of different kinds mounted in various kinds of handles. Among these are medium and dessert Knives in decorated china handles to go with china dinner or tea services. These can be decorated to order if desired to match any particular design. For many the mountings in carved antique ivory in medium, dessert, orange and fruit Knives and Nut Picks, as well as sets of Carvers for joints and game, will commend themselves. For the more extravagant there are pearl mountings with sterling silver ferrules or bolsters, in medium or dessert Knives and Carvers, together with orange and fruit Knives finished the same way, with saw edges both on back or edge of blade to facilitate cutting through the rind of the fruit. These are said to pare other fruits equally well. We noticed, too, an assortment of stag handle Carvers with sterling silver ferrules and caps, in addition to sets trimmed with natural tips, both horn and stag, and hollow metal handles of German silver, silver plated and hand engraved. These goods are suitable for fine trade.

## Price-Lists, Circulars, &c.

**THE IOWA FARMING TOOL COMPANY**, Fort Madison, Iowa: Farming Tool catalogue, 1893-94. The catalogue, which is well printed on good quality of paper, contains illustrations, descriptions and list prices of this line of goods, with telegraph code. The company have added to their factory and storage warehouse, as referred to in another column.

**LOGAN, GREGG & Co.**, Pittsburgh, Pa.: Fall and winter catalogue. Illustrations show Guns, Revolvers, Ammunition, Oil Stoves, Stove Boards, Coal Vases, Coal Hods, Fenders, Shovels, Pokers, Stove Pipe, Lanterns, Lamps, Meat Cutters and Stuffers, Door Springs and Checks, Huskers, Ice Creepers, Sleds, Skates, Saws, Wringers, Wheelbarrows, Carvers, &c.

**CHAS. J. GODFREY**, 11 Warren street, New York: Firearms, Bicycles and Sportsmen's Goods. A catalogue of 44 pages illustrates these goods, with prices. The object of this special dealers' price-list is to reduce stock, profits having been sacrificed, it is stated, for this purpose.

**THE SKINNER CHUCK COMPANY**, New Britain, Conn.: Skinner Chucks. These goods are illustrated in a pamphlet, which the manufacturers state is not their catalogue: also that a complete illustrated catalogue and price-list will be sent to any address free on application.

**NIAGARA STAMPING & TOOL COMPANY**, Buffalo, N. Y.: Testimonial circular. Testimonials are given from those using the company's Tinnings' Tools, Squaring Shears, Rotary Shears, Ring Shears, Elbow Shears, Gang Punches, Power and Foot Presses, Dies, Can Makers' Tools, Process Kettles, &c.

**THE A. J. HARWI HARDWARE COMPANY**, Atchison, Kan.: Price current, fall and winter, 1893-94. The book contains 40 pages of illustrations and list prices. The company remark that the prices given have been based on present market values, and that they believe all articles manufactured of iron and steel have touched the lowest figures they will ever reach; also that it is their belief that a change for the better must soon come, and that values must appreciate.

**SCOTT HARDWARE COMPANY**, Paducah, Ky.: Illustrated and descriptive catalogue and price-list No. 2, 1893-94. This is the most complete catalogue issued by the company, and represents to a great extent the character of their business. Illustrations are given of stamped and pieced Tinware, Lamps, Lanterns, Sewer Pipe, Granite Ware, Scales, Safes, House-Furnishing Goods, Cutlery, Gasoline and Cook Stoves, Heating Stoves, Grates, &c. The book contains 128 pages.

**MORSE TWIST DRILL & MACHINE COMPANY**, New Bedford, Mass.: Twist Drills, Chucks, Reamers, Milling Cutters, Taps and Dies, and Machinists' Tools. Drills and Reamers are shown in great variety, also Steel Mandrels, Drill Chucks, Milling Cutters, Slotting Cutters, Combined Pipe Tap and Drill, Twist Drill Grinding Machine, &c.

**C. L. MUNGER**, Agent, 142 Lake street, Chicago, Ill.: Clamps. A catalogue devoted to these goods illustrates Colt's Eccentric Clamp, Cabinet Makers' and Builders' Steel Bar Clamp, Manufacturers' and Builders' Steel Bar Vise Clamp, Colt's Screw Clamp and

**Denney's Self Adjusting Hand Scflew.** C. L. Munger is also agent for; E. H. Titchener & Co., Binghamton, N. Y., manufacturers of Staples, Double-Pointed Tacks, &c.

**THE KLEIN LOGAN COMPANY**, Pittsburgh, Pa.: Standard Railroad, Mining and Quarry Tools, Sledges and Hammers, Fire Shovels, &c. Illustrations and list prices are given of Mattocks, Grub Hoes, Vineyard Hoes, Cooper Froes, Picks, Pick Eyes, Sledges, Mauls, Hammers, Wedges, Chisels, Crow Bars, Drills, Fire Shovels, Coal Tongs, &c. A special quality of Picks, Mattocks and Hoes are manufactured, stamped warranted.

**SIDNEY SHEPARD & Co.**, Buffalo, N. Y.: Seasonable goods. The catalogue of 18 pages has on the front cover a calendar for six months beginning with August, 1893, and ending with February, 1894. Sheet-metal goods of various sorts are noted, such as Coal Hods, Coal Vases, Stove-Pipe Elbows, Tea Kettles, Oil Cans, Eave Troughs, Stove Boards, Registers and Ventilators, Dampers, Lanterns and various Kitchen Utensils.

**W. N. DURANT**, 237 Twenty-second street, Milwaukee, Wis.: Circular calling attention to the Durant Counting Machines, such as Press Counters, Flour Tallies, Electric Counters, Alarm Counters, Revolution Counters, &c. A record can be kept of the work done on any machine. An exhibit is made at the World's Fair, Manufacturers Building, north end gallery, Column T 108.

**WILLIS E. MILLER**, proprietor Mount Carmel Axle Works, New Haven, Conn.: Fine Coach and Carriage Axles. Prominent among the styles of Axles shown in a catalogue under date of September 1, 1893, are the following: Full Collinge, half Collinge, Collinge Collar, Miller Patent, Stivers' Long Swell, Miller Patent and Long Swell Double Collar. This business was established in 1833 by Henry Ives, since which time it has been conducted under the firm names of Frederic Ives, Frederic Ives & Co., Ives & Miller, who were succeeded in 1888 by Willis E. Miller, the present proprietor.

**RHODE ISLAND PERKINS HORSE SHOE COMPANY**, Providence, R. I.: Perkins' pattern Horse and Mule Shoes and Toe Calks. Illustrations are given of toe-weight, side-weight, medium, road, trotting or snow Shoes, mule, cowboy and XL steel Shoes; also various patterns of the Goodenough Shoe and of Toe Calks.

**MORLEY BROTHERS**, Saginaw, Mich.: Blue Line Lumbering Tools. The goods shown in a catalogue devoted to this line include Hooks, Peaveys, Cant Hooks, Pike Poles, Pickaroons, Timber Carriers, Skiddings Tongs, Swamp Hooks, Loading Blocks, Logging Dogs, Rafting Dogs, Chain Hooks and Cold Shuts, Saw Wedges, Cant Hooks and Peavey Handles, Axe Handles, Ox Bows, Sawdust and Slab Dump Carts, Shingle and Heading Brands, Log Rules, Ox Harness, &c. It is remarked that their new factory for the manufacture of these tools has just been completed, and that no expense has been spared to make it complete in all departments.

**BELLEVUE PUMP COMPANY**, Bellevue, Iowa: Kegler's Galvanized Iron Chain Pump Tubing and all Iron Galvanized Chain Pump Curb. Illustrations are given of these goods; also of Buckets,

Coupling, Block and Clamp. Wooden Curbs are also manufactured by the company.

**TOWER & LYON**, 95 Chambers street, New York: Lanterns. Prices and illustrations are given of Police, Dash House, Conductors' Lanterns, &c.

**TOLEDO WHEELBARROW WORKS**, Toledo, Ohio: Wheelbarrows. Illustrations are shown of the jointless bent leg Barrow, in various styles, with Wood and Steel Trays; Barrows with straight legs, braced and unbraced; also Brick, Bark, Stone and Sawdust Barrows. Emphasis is placed on the desirability of their new steel wheel for Barrows.

**HULBERT BROTHERS & Co.**, 26 West Twenty-third street, New York: Football Supplies, Gymnasium Clothing, &c. A pamphlet under date of September 1 is devoted to revised prices of the above goods. Illustrations are given of single and double Chest Weights.

**E. H. TITCHENER & Co.**, Binghamton, N. Y.: Staples, double-pointed Tacks, Wire Nails, Pins, Links, &c. Illustrations and list prices are given of Barbed, Blind and Spring Staples, double pointed Steel Carpet Tacks, Electricians' and Broom Staples, Staples for poultry netting, Barbed Wire, Hoops, Speaking Tubes, Butter Tubs, Grape Baskets, &c.; also Pail and Tub Ears, Clinch Staples, Bed Links, Hoop Clamps, Steel Barbed Dowel Pins, Towel Holders, &c.

## It Is Reported—

That a quantity of Razors and Cutlery was stolen from the Hardware store of Black & Co., Boone, Iowa, on the 12th inst.

That the Hardware business of Leach & Tuttle, Palmyra, N. Y., has resumed after a suspension of one month's duration.

That the Stove store of Fisk & Schlottman, Hightstown, Pa., was visited by fire on the 11th inst. and damaged to the extent of \$5000. The insurance was \$3000.

That J. W. Fauble, dealer in Hardware, Stoves and Tin, Perry, Kan., has retired from business.

That N. O. Sawyer has recently entered the Stove, Tin and Plumbing business at Amesbury, Mass.

That Peter Heintz, Grand Island, Neb., dealer in Implements, &c., is out of business.

That F. G. Bauer & Co. will continue the Hardware and Seed business formerly conducted by Shaffer Bros. & Naumann, Allegheny City, Pa.

That the furniture and Stove store of J. H. Groder, Waterville, Maine, was visited by fire on September 8, which damaged the stock to the amount of \$5000, fully covered by insurance.

That fire at Beardstown, Ill., on August 31 destroyed the Agricultural Implement store of Theodore W. Krohe.

That four tramps were recently arrested about half a mile east of Delana, Minn., having in their possession Pocket Knives, Razors and Revolvers which they had stolen from the Hardware store of Lee & Johnson, at Murdock, Minn.

That C. P. Wright of Ottawa, Ill., is building a large addition to his Hardware store, which, when completed, will add much to the appearance of the building and increase the facilities for doing business.

That the Implement warehouse of H. N. Rowley, Hanover, Mich., was destroyed by fire on September 5.

That the store of the Moorehead Hardware Company, Moorehead, Minn., was entered by thieves on the afternoon of September 13, who broke through an upper side window in the rear. The secured \$130 worth of Revolvers, Knives and Razors. People were passing along the street during the time, but the burglars were not disturbed.

That D. S. Biddlecome of Sarcxie, Mo., has sold his interest in the Hardware store to his partner, Philip Hoyle.

That fire broke out in the Hardware store of F. Vancamp & Co., Hastings, Ont., on the night of September 4, and the building was completely destroyed. The contents were insured for \$3500.

That A. A. Fillebrown, Ayer, Mass., has admitted his brother R. L. Fillebrown, as a partner in his Hardware and Stove business.

That Reed, McIntyre & Wheeler have purchased the Hardware store of Reed & Hartson, Jamestown, N. Y., and will take possession within a few days.

That the Hardware store of Haas & Breiers, Kankana, Wis., was robbed September 1 of Cutlery and Revolvers valued at \$40.

That the new \$5000 brick Hardware store being erected by E. D. Davis, Mount Vernon, Wash., is about completed. It is a two-story structure, 30 x 94 feet, and adjoins his present quarters on the east.

That the Hardware store of Starr & Brokenshaw, Elgin, Ore., was destroyed by the destructive fire which visited the town August 31.

That E. B. Dellinger, Hardware dealer in St. Paul, Minn., has removed to Hamilton.

That Jewell & Schmidt, Hardware dealers, at Wabasha, Minn., have been succeeded by J. Schmidt.

That Ott & Boden's Hardware store and warehouse, at West Bend, Iowa, was destroyed by fire September 12.

That Sutherland Bros., Hardware dealers, at Ada, Minn., have been succeeded by Larson & Lystad.

That the contract for furnishing the Hardware for the new Government building at Lansing, Mich., has been let to Jacob Stahl of that city.

That C. C. Clement & Co., Hardware dealers in Winona, Minn., have been succeeded by the C. C. Clement Hardware Company.

That the Gwaltney Hardware & Implement Company, at Escondido, Cal., are erecting a warehouse, 48 x 100 feet in size.

That the store of C. E. Bondy, Hardware dealer, at Eyota, Minn., was burglarized recently.

That J. Weinmann, Jr., general merchant, at Cologne, Minn., has been succeeded by A. J. Fritz.

That H. Krause, Hardware dealer, at Montrose, Minn., has been succeeded by C. Krause, Jr.

That H. F. Shaw of Belchertown, Mass., has removed his Tin shop to his own premises on Walnut street.

That the Hardware store of Albert West, Des Moines, Iowa, was robbed September 6, the thieves securing a lot of Razors, Knives and other small articles of value.

That the Rutka-Hamilton Hardware Company, Grand Rapids, Mich., have

been incorporated, with a capital of \$6000.

That the Hardware store of R. H. Suettinger, Two Rivers, Wis., was broken into on the night of September 7 and a large quantity of Silver Ware taken.

That the Hardware store of R. M. Shaffer of Neoga, Ill., was burglarized during the night of September 8 and six Shotguns taken, among other things.

That the firm of Eng & Braun, Covington, Ky., tanners, have been dissolved, Mr. Eng retiring. The business will be continued by Joseph Braun.

That three men who are probably the parties who recently burglarized the Mangas Hardware store in Toledo, Ohio, have been arrested. They were attempting to dispose of a large number of Razors and Pocket Knives in a neighboring town.

That William Weightman is now assisting W. C. Andes & Co., Mound City Mo., in the Hardware business.

That a fire at Baldwin, Wis., on the evening of September 7 destroyed the Hardware store of Settergreen & Pittman.

That the firm of Roe & Kingery of Buchanan, Mich., have been dissolved. E. S. Roe having purchased the entire interest of H. F. Kingery and continuing the business.

That Mr. Lamphier has sold out his Tin and Hardware business, at Hardwick, Vt., to Mr. Cowles of Richford, who has taken possession.

That Simpson Bros.' Hardware store, at Duncombe, Iowa, was destroyed by fire a short time since. The loss was \$2000.

That B. Busenbark's Hardware store, at Birdseye, Ind., was damaged by fire several weeks ago to the extent of \$2500.

That F. W. Taylor's Hardware stock, at Sioux Falls, S. D., was recently damaged by fire to the amount of \$6000.

That the B. Fontaine Hardware Company, Green Bay, Wis., have been incorporated, with a capital of \$20,000. The incorporators are Benjamin Fontaine, Raphael Fontaine and Albert J. Fontaine.

## Paints and Colors.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

The general run of business and the surroundings in nearly all branches of the trade remain practically the same as they were last week. With very few exceptions the purchases have been quite as moderate and marked by the same conservative tendencies, while prices have undergone no radical variation, although still somewhat irregular in several departments. Western competition in certain of the leading staples continues keen, but apart from that no disturbing feature is visible at the moment.

**White Lead.**—Prices have continued irregular, with independent corrodors quoting about  $\frac{1}{4}$ ¢ @  $\frac{1}{2}$ ¢ under the National Company's list, and the latter interest protecting their trade where competition is keenest, while adhering to the official list in this city and vicinity. Business has been fair in volume and nearly up to full average for the season. The demand at present, however, is chiefly for moderate quantities pigment in the smaller packages.

**Red Lead.**—The demand for German has continued fair, and that fact, in connection with advices of enhanced cost abroad, has stiffened prices here to the extent of about  $\frac{1}{4}$ ¢ @  $\frac{1}{2}$ ¢. American brands have been selling fairly and prices for the same remain unchanged.

**Litharge.**—Contracts have been quite as numerous as they were last week, particularly for the cheaper class of stock, but the buying was on very conservative lines. Prices are unchanged and fairly firm for all grades.

**Orange Mineral.**—On foreign brands prices are very firm at  $7\frac{1}{2}$ ¢ @  $7\frac{3}{4}$ ¢ for German and  $10\frac{1}{2}$ ¢ @  $10\frac{3}{4}$ ¢ for French, in invoice lots. Demand is slower, however, the higher cost tending to restrict purchases for future delivery.

**Zincs.**—New purchases of domestic Oxide have been on a moderate scale and demand has improved very little, if at all. Deliveries on old contracts have improved somewhat, which fact would indicate heavier consumption. Foreign brands are unchanged in price and selling in merely routine way.

**Colors, &c.**—Grinders have purchased fairly of bulk Colors and the regular jobbing movement in the finer class of Dry and Oil Colors has been fully up to the average. Ready-mixed Paints have been sold rather more freely for autumn delivery, but orders are as yet somewhat backward.

**Miscellaneous.**—Chalk has undergone no decided change, although full supplies tend to keep the market rather weak. Whiting has been in better demand, but prices have undergone no change. Other goods remain quiet.

## Oils and Turpentine.

There have been fewer changes in prices during the past week, and the market shows steadier tone in view of some moderation of selling pressure that had a demoralizing influence during the early part of the month.

**Linseed Oil.**—The local manufacturers keep their quotation for raw Oil at 37¢. Out-of-town competitors quote 35¢ @ 36¢, and note some large sales in the vicinity. Rumor had it that one local brand was sold at as low as 35¢, with extra for packages. The general situation is quite as uncertain as it was a month ago.

**Cotton-Seed Oils.**—There has been further improvement in prices under the influence of additional export purchases, freer buying by large Western consumers and generally better demand. Prime Summer Yellow sold at from 35¢ up to 38 $\frac{1}{2}$ ¢, Summer White at from 42¢ to 44¢ and new prime crude at from 28¢ to 34¢. It is claimed that leading producers are unusually well sold up.

**Lard Oil.**—Prices for prime Lard Oil have moved up to 67¢ @ 68¢, and the market is very firm at the advance. The turn is attributed chiefly to higher cost of raw material, but sales have increased sufficiently to exert some influence. At present the demand is fairly active.

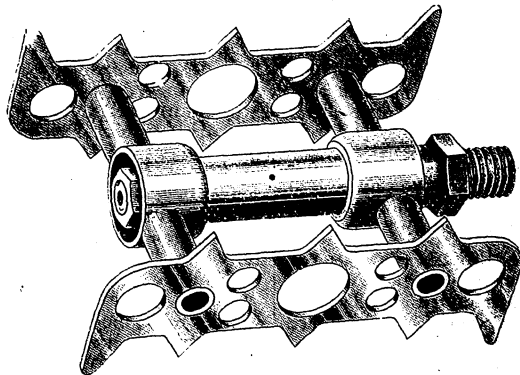
**Fish Oils.**—Nearly 1000 barrels crude Sperm have been sold at 65¢ and the unsold stock in first hands is sold at 70¢. Crude Whale sold in a small way at 40¢ and about 18 barrels Menhaden. All the Pressed and Bleached products are meeting with about usual sale in a jobbing way at steady prices.

**Spirits Turpentine.**—A further increase in stocks in receivers' hands has caused more pressure to sell and forced prices lower. Regular barrels went at 27 $\frac{1}{2}$ ¢ @ 27 $\frac{3}{4}$ ¢, and machine at 28¢ @ 28 $\frac{1}{4}$ ¢, on the dock.

The strike at Oliver's South Tenth street mill, Pittsburgh, has been declared off.

**New Racing Pedal.**

The Union Cycle Mfg. Company, Highlandville, Mass., are putting a new racing pedal on the market, as herewith

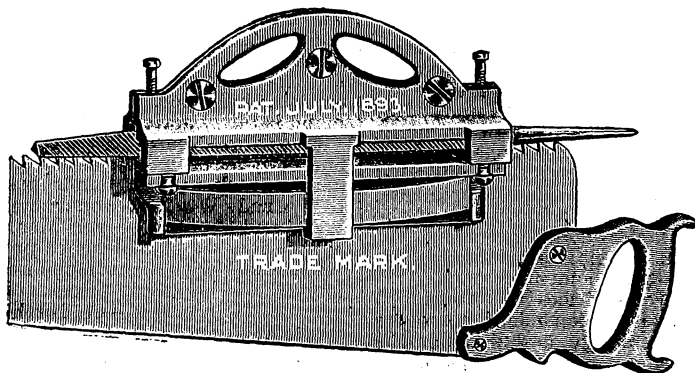


*New Racing Pedal.*

shown. The hub, side plate supports and ball races are described as being one piece, thus designed to give the greatest rigidity to the pedal, and to make the relative positions of the ball races in positive alignment and absolutely dust proof, all the parts being completely under cover. The studs are screwed directly into the cranks with right and left hand threads, thereby doing away with the clamping nut and obviating the annoyance so often caused by losing it when riding. It is remarked that owing to the action of the pedal when in use there is a constant tendency to tighten the stud in the socket, and that it cannot become loosened. Another advantage claimed by the manufacturers for this style of pedal is that it will work closer to the crank, thereby narrowing the tread. It is claimed that the pedal combines strength and rigidity, easy running, because the bearings are accurate; neat appearance and lightness, the weight of road pedals being only 12 ounces per pair, and racing pedals considerably lighter.

**The Perfect Saw Jointer.**

The accompanying cut represents a saw jointer being introduced by E. Bertram Pike, Pike Station, N. H. The claims made for the jointer are as follows: That it joints saw teeth absolutely; that a special file is not required, a common taper or flat file being used in the jointer; and that it can be adjusted in a moment to the largest cross-cut or to the finest hand saw, always



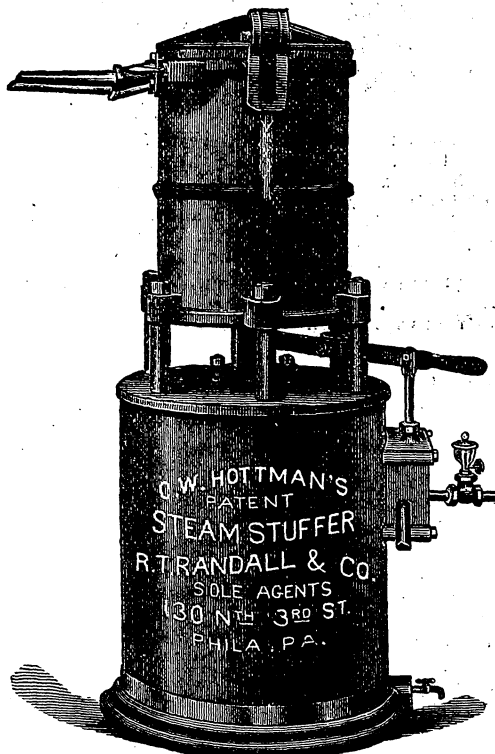
*The Perfect Saw Jointer.*

setting square on the teeth. The jointers are designed to retail for 50 cents each.

**Hottman's Steam Stuffer.**

The steam sausage stuffer shown herewith is put on the market by R. T. Randall & Co., sole agents, 130 North

Third street, Philadelphia, Pa. The stuffer is described as operating by the



*Hottman's Steam Stuffer.*

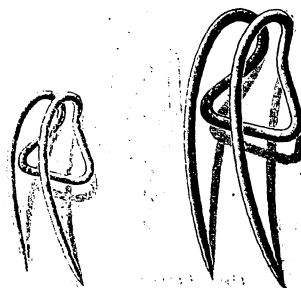
action of direct steam pressure, which may vary from 10 to 35 pounds, applied from underneath upward. The steam

leakage is impossible. The machine stands directly on the ground, its entire height not exceeding 48 inches, its weight keeping it in position, thereby obviating the necessity of fastenings. The steam cylinder consists of two distinct iron walls with asbestos packing in the intervening space, resulting in a saving of steam. In operation the steam is admitted by turning the globe valve and raising the lever, the steam thus forcing the piston up, which in turn forces the sausage meat out through the two discharge nozzles. The manufacturers claim that no leaking water or lubricating oil can run into the meat, as all the working parts are below; that the meat cylinder is easily filled and the admixture of air with the meat prevented, and that the operator has the steam entirely under his control, being able to stop or start at any moment.

**Twentieth Century Drapery Pin.**

The Gould-Mersereau Company, 261-263 Canal street, New York, are introducing the Twentieth Century drapery pin, shown in Nos. 1 and 2, which are

full-size cuts. It is made of spring brass wire, and when adjusted is referred to as not easily displaced or disarranged, while it can readily be re-



No. 1.

No. 2.

**Twentieth Century Drapery Pin.**

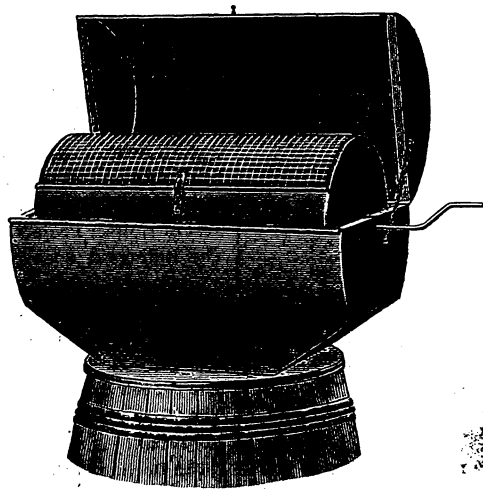
moved when necessary. A still larger size for heavy draperies, curtains, portieres, &c., will soon be ready. The pins are made in brass or brass nickle-plated, and are packed in gross packages—five gross in a carton.



**Dustless Barrel Ash Sifter.**

Held & Gruenhagen, St. Anthony Park, Minn., are introducing the dustless barrel ash sifter, herewith shown. The material of which the sifter is made is principally cast and sheet iron. The inside roll is made of galvanized iron netting, with  $\frac{1}{4}$ -inch mesh. The manufacturers claim that the sifter is

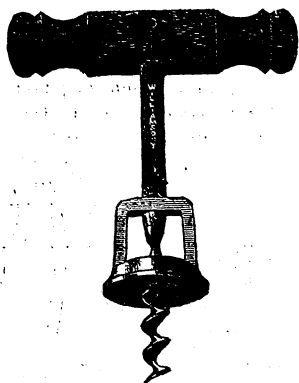
even pressure on the top of the bottle when drawing the cork. The flat bottom of the cup, it is remarked, obviates the danger of breaking the bottle, as a cone shaped cup is apt to do by wedging itself on to the neck of the bottle when used for hard pulling corks. The directions for extracting a cork are to keep on turning the handle, but not to pull, when, it is stated, the cork will be raised out of the bottle.

*Dustless Barrel Ash Sifter.*

practically dust proof, and may be used in a basement or back shed without making any dust or dirt; also that the revolving principle makes the sifter easy for any person, even a little child, to operate. The sifter is made in two sizes: No. 1, with inside roll 12 inches long by 12 inches in diameter; No. 2, inside roll 24 inches long by 12 inches in diameter. The bottom casting of both sizes will fit any common-sized barrel.

**New Power Corkscrew.**

C. T. Williamson Wire Novelty Company, Camp and Mulberry streets, Newark, N. J., are introducing the Power corkscrew illustrated herewith. The handles are made of selected apple-wood and mottled rosewood, securely fastened to the nickel-plated screws by tempered steel pins. The special ad-

*New Power Corkscrew.*

vantage claimed for the corkscrew is the cup, which is loose on the screw, thus adjusting itself on the top of the bottle, making, it is stated, a direct pull even if the screw is entered slanting and runs out to the edge of the cork. Attention is called to the flat bottom of the cup, which makes an

The manufacturers advise us that all their forged corkscrews are made by an improved process similar to their wire corkscrews, and are warranted not to tear or pull through the cork.

**The Success Yoke.**

S. C. Johnson of Racine, Wis., has just brought out a carriage yoke which has a number of excellent points. It is called the Success wrought-steel center yoke, and an illustration is herewith given. As indicated by the name, the center is of steel, which is wrought in artistic finish with acorn tips. It is furnished to the trade either covered with wood, or plain, for the buyer to finish according to his own

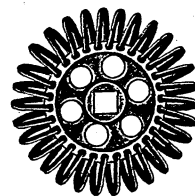
*The Success Yoke.*

taste. The swivel center is lined with leather. The combination of the steel center with the wood cover secures strength and lightness, while the fine workmanship makes its appearance strikingly handsome. The centers are furnished nickel plated if desired.

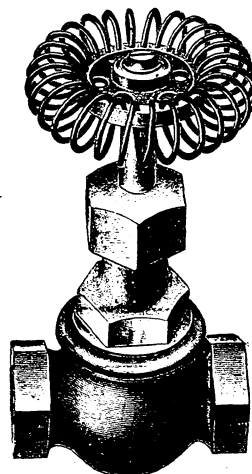
**Prouty's Wire Valve Wheels.**

N. H. Prouty, Charlton City, Mass., is introducing wire valve wheels, as shown in the accompanying cuts. As seen in Fig. 1, the wheel consists of a metal hub plate surrounded by coiled wire, all nickel plated. The manufacturer refers to the combination of the coiled wire and the hub plate being such as to give a strong, rigid wheel, a good grasping surface for wet or greasy hands, and as presenting a pleasing appearance to the eye, and states that they are always cool. The point is made that these wheels are not open to the

objection of warping and splitting off, as wooden wheels used for this class of work are; and that the wire wheel is the cheapest, repairs being taken into

*Fig. 1.—Wire Valve Wheel.*

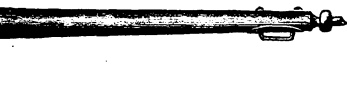
consideration. It is remarked that those in charge of boilers would be more apt to test try cocks and gauges if valve wheels were used that were always cool. The wheels are made to fit all sizes and makes of valves, &c., and are designed for use on throttle

*Fig. 2.—Wire Wheel on Valve.*

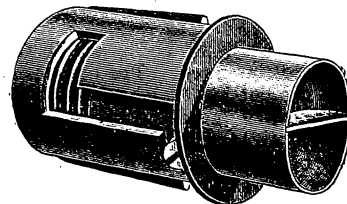
valves, radiators, water glasses, gauge cocks, oilers, injectors, and all hot valves.

**The Gardner Burglar Bolt.**

A neat bolt for fastening window sashes has been put on the market by the Gardner Sash Balance Company,



312 First National Bank Building, Chicago. The illustration herewith given shows the bolt projecting from its socket. When closed it is flush with

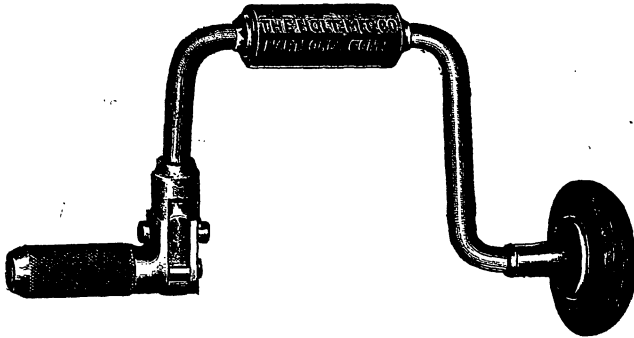
*The Gardner Burglar Bolt.*

the rim. The socket is 1 inch in depth, circular in shape and is easily put in place, merely requiring a  $\frac{1}{4}$ -inch hole to be bored, into which it is driven. It is intended to be inserted in the side rail of the upper sash near the bottom rail. It can thus be used to keep the lower



sash from being raised or the upper sash from being lowered by a person outside the window. Should the opening of the window be needed for ventilation, the bolt can be placed a few inches above the lower sash and the window cannot be opened any further. As will be seen by reference to the cut, the bolt rests on a spring, while a set screw working in a slot holds it fast either closed or open. An indentation in the end enables the ends of the fingers to be inserted easily so as to turn

it is remarked, can be made by bringing the cam pin in contact with any object in reach; also that all the working parts are polished and hardened, making it work smoothly and easily and insuring durability. The device for holding the bit firmly in line, and not loosening the hold until purposely released, used in this brace, is the same as that described in *The Iron Age* of July 20, 1893, in which an illustration of the Smith brace was given, as manufactured by the above company. The point

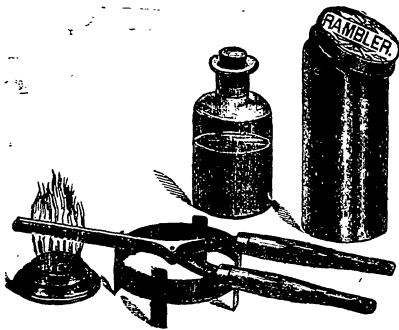


The Holt Ratchet Brace.

the bolt. It is made of iron and is electro-plated in all finishes, including Bower-Barff and bronze. It retails for 35 cents by mail.

#### Rambler Alcohol Stove.

The accompanying illustrations show the Rambler alcohol stove, being introduced by Geo. L. Thompson Mfg. Company, 6126-6130 La Salle street, Chicago. It consists of a handsomely nickel-plated case, stamped from one piece of metal, 4 inches long and 1½ inches in diameter. This has a beaded cover which fastens over lugs on the case, holding it securely in place. The case contains the stove, stand and bottle for alcohol; the stand opening to a diameter of 2½ inches. A spoonful of alcohol fills the stove, which, it is stated, will burn for ten minutes with steady,



Rambler Alcohol Stove.

intense heat, which is ample for the purposes intended. The point is made that the bottle of alcohol is always at hand when needed, and cannot be spilled while in the case. The case may be carried in the pocket or satchel when traveling, the stove being designed for heating curling irons or liquids.

#### The Holt Ratchet Brace.

The accompanying cut represents a ratchet brace put on the market by the Holt Mfg. Company, Hartford, Conn. The ratchet used in the brace is referred to by the manufacturers as simple in its operation, with no uncertainty about which way to turn the cam. Changes,

is made that the ratchet brace, as well as all the braces sold by this firm, is fitted with an anti-friction washer under the head, which is durable, and that the goods being nicely finished with lignum vitæ heads and cocobolo handles, full nickel plated, added to their superior working qualities, makes them desirable.

There are indications of trouble, says the Cincinnati *Commercial Gazette*, between two well known firms—one in this city, the other across the river—which threatens to end in litigation in the form of suit for injunction. The principals in the affair are the J. D. Smith Foundry Supply Company of Freeman avenue, and the Southern Steel & Aluminum Alloy Company of Newport, Ky. The claim is made by the first-named concern that C. L. Hartsfeld, the general manager of the Newport enterprise, is using their name as reference without their permission, and for a time without their knowledge. Hartsfeld's company manufacture a certain material which it is claimed enables foundrymen to economize largely in the cost of producing articles when the compound is used. They advertise extensively. At the bottom of the advertisement are the names of several firms over the country given as references. Among them is the Smith Foundry Supply Company of this city. This company, as stated, claim their name is used without their permission, and that they do not want to recommend the material. In addition, they are given much annoyance in receiving numerous inquiries as to the value of the compound. The company claim further that they have requested Hartsfeld to stop the use of their name in his advertisements, but that he pays no attention to their requests. They have accordingly decided to apply to the courts for an injunction to stop the further use of their name. Mr. Hartsfeld, however, when seen claimed that the Smith Company were agents for the sale of his aluminum alloy for a number of years, but that he dropped them last March.

The following tariff changes in the Bahamas have been reported by U. S. Consul McLain of Nassau: "Steel rails and sleepers used in the construc-

tion of railways and tramways, trucks and all other rolling stock which can only be used on railways or tramways, and hydraulic presses for baling purposes are exempt from import duties." The object of placing these articles on the free list is the further encouragement of the sisal-growing industry, the large plantations requiring railways or tramways for handling their product.

#### CONTENTS.

	PAGE.
Triple-Expansion Vertical Engine of the General Electric Company. Illustrated.	505
Duluth News.....	511
The De Laval Steam Turbine. Illus.....	512
World's Fair Notes .....	514
Test of Holtzer Projectiles.....	514
The Billings & Spencer Drop Hammer. Illustrated.....	515
The New Navy Rifle.....	515
Iron and Steel at the World's Columbian Exposition.—VI.....	516
The French Engineers in Chicago.....	517
The Week.....	518
Editorials:	
The Decline in the Amalgamated Association.....	519
Machinery Sales at the World's Fair ...	519
Cinder-Mixed Iron of the East.....	520
The Hurd Mine Sold.....	520
Correspondence.....	520
Obituary.....	521
Washington News.....	521
Personal .....	522
Manufacturing:	
Iron and Steel.....	522
Machinery.....	522
Hardware.....	523
Miscellaneous.....	523
Trade Report:	
Philadelphia.....	524
Chicago.....	524
Cincinnati.....	525
St. Louis.....	525
New York.....	526
Financial.....	526
Metal Market.....	527
British Iron and Metal Markets... ..	528
Taxing Pay Checks.....	528
Patent and Trade-Mark Congress.....	529
Mesaba News.....	529
The Premier Steel Works .....	529
Hardware:	
Condition of Trade.....	530
Notes on Prices .....	532
The Boston Iron and Hardware Club... ..	533
Question in Regard to Collections .....	533
Organization Among Retailers.....	534
National Association of Hardware Merchants.....	534
Freezers.....	536
Seventy-fifth Anniversary. Illus.....	536
Report from Charleston.....	536
Aluminum in Bicycles .....	537
Trade Items.....	537
Meriden Cutlery Company's New Goods.....	537
Price-Lists, Circulars, &c.....	538
It Is Reported —.....	538
Paints and Colors.....	539
New Racing Pedal. Illustrated .....	540
The Perfect Saw Jointer. Illustrated..	540
Hottman's Steam Stuffer. Illustrated..	540
Twentieth Century Drapery Pin. Illus.	540
Dustless Barrel Ash Sifter. Illus.....	541
New Power Corkscrew. Illustrated... ..	541
The Success Yoke. Illustrated.....	541
Prouty's Wire Valve Wheels. Illus....	541
The Gardner Burglar Bolt. Illustrated.	541
Rambler Alcohol Stove. Illustrated..	542
The Holt Ratchet Brace. Illustrated..	542
Current Hardware Prices.....	543
Current Metal Prices.....	55

# Current Hardware Prices.

SEPTEMBER 20, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50@10@50&10&5 signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

## Adjusters, Blind—

Domestic ..... \$ doz \$3.00, 83% @ 83% & 10%  
Excelsior ..... \$ doz \$10.00 ..... 60&10&25  
North's ..... list net @ 10%  
Zimmerman's—See Fasteners Blind.

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—

Eagle Anvil, 7 lb 94 ..... 15@15&25  
Peter Wright's ..... 11@11 1/2  
Armstrong's Mouse Hole ..... 10@11 1/2  
Am. Wrought, Horseshoe brand, 11@11 1/2  
Trenton ..... 10@10 1/2  
Wilkinson's ..... 10@10 1/2  
Moore & Barnes Mfg. Co. .... 83%&25

## Anvil Vise and Drill—

Millers Falls Co., \$18.00 ..... 20%  
Cheney Anvil and Vise ..... 25%  
Allen Anvil and Vise \$3.00 ..... 40&10%  
Star ..... 45&25

## Apple Parers—See Parers, Apple, &c.

## Augers and Bits—

Common Augers and Bits ..... 70@70&10%  
Boring Machine Augers ..... 70@70&10%  
Car Bits, 12 in. twist ..... 50%  
Russell Jennings' Augers and Bits 25&10%  
Jennings' Pattern Car Bits ..... 40%  
Jennings' Pattern Auger Bits ..... 60%  
Snell's Bits ..... 60&5%  
C. E. Jennings & Co., No. 10, extension  
Up ..... 60%  
C. E. Jennings & Co., No. 30 ..... 60%  
C. E. Jennings & Co., Auger Bits, 1/2 set,  
32% quaters, No. 5, \$5; No. 30, \$3.50 25%  
Lewis' Patent Single twist ..... 45%  
Pugh's Black ..... 20%  
Pugh's Jennings Pattern ..... 15&10%  
L'Hommedieu Car Bits ..... 15%  
Forstner Pat. Auger Bits ..... 15%  
Cincinnati Bell-Hangers' Bits ..... 30&10

## Bit Stock Drills—

Morse Twist Drills ..... 50&10&5%  
Standard ..... 50&10&5%  
Cleveland ..... 50&10&5%  
Syracuse, for metal ..... 50&10%  
Syracuse, for wood (wood list) 30&10%  
Cincinnati, for wood ..... 30&10%  
Cincinnati, for metal ..... 45&10%

## Expansive Bits—

Clark's small, \$18; large, \$26. 35@55&10%  
Ives' No. 4, \$ doz. \$80 ..... 40%  
Swan's ..... 40%  
Steer's, No. 1, \$26; No. 2, \$18 ..... 35&40%  
Stearns' No. 2, \$48 ..... 20%

## Gimlet Bits—

Common ..... \$ gross \$2.75@3.25  
Diamond ..... \$ doz \$1.25 ..... 40&10%  
Bee ..... 25@25&5%  
Double Cut ..... 45@45&10%  
Shepardson's ..... 30&10%  
Cl. Valley Mfg. Co. .... 30&10%  
Hartwell's ..... \$ gro., \$10.00 ..... 40&10%  
Douglass' ..... 40&10%  
Ives ..... 60@60&10%

## Hollow Augers—

Ives' ..... 33% @ 33%  
French, Swift & Co. (Beecher) ..... 50%  
Douglass' ..... 50%  
Bonney's Adjustable, \$ doz \$48 ..... 50%  
Stearns' ..... 20&10%  
Ives' Expansive, each \$4.50 ..... 50&5%  
Universal Expansive, each \$4.50 ..... 20%  
Wood's ..... 25@25&10%  
Cincinnati ..... 25&10%  
Cincinnati Standard ..... 25&10%

## Ship Augers and Bits—

L'Hommedieu's ..... 15&10@15&10&5%  
Watrous' ..... 25@25&10%  
Snell's ..... 25@25&10%  
Snell's Ship Auger Pat'n Car Bits  
15&10@15&10&5%

## Awl Hafts—See Hafts, Awl.

## Awls—

Awls, Jewing, Common ..... \$ gr. 85@90%  
Awls, Should. Peg ..... \$ gr. \$1.50@1.55  
Awls, Pat. Peg ..... \$ gr. 85@88%  
Awls, Shouldered Brad ..... \$ gr. \$1.30@1.40  
Awls, Handled Brad ..... \$ gr. \$2.60@3.00  
Awls, Handled Scratch ..... \$ gr. \$4.00@4.50  
Awls, Socket Scratch ..... \$ doz. \$1.10@1.20

## Awl and Tool Sets—See

Sets, Awl and Tool.

## Axes—

First quality, best brands \$7.00 ..... Beveled 7.50  
First qual., other brands ..... 6.50  
Second quality ..... 5.50

## Axle Grease—See Grease, Axle.

## Axles—

No. 1, 3/4 @ 4 1/4, No. 2, 5 @ 6 1/2  
Nos 7 to 14 ..... 60&10%  
Nos 15 to 28 ..... 47%  
Nos 19 to 22 ..... 70%  
Concord Axles, loose collar ..... 44% @ 6%  
Concord Axles, solid collar ..... 54% @ 7%  
National Tubular, Self Oiling ..... 33% @ 33% & 5%

## Bag Holders—See Holders, Bag.

## Balances—

Spring Balances ..... 40%  
No. 2000 20 30  
Chatillon, \$ doz ..... \$0.80 0.95 1.75 net  
Chatillon Straight Balances ..... 40%  
Chatillon Circular Balances ..... 50&10%

## Barb Wire—See Wire, Barb.

## Bars—

### Crow—

Cast Steel ..... \$ doz \$3 1/2  
Iron, Steel Points ..... \$ doz \$3 1/2

## Basins, Wash—

Standard Fiberglass, No. 1, 10 1/2 in., \$1.80;  
12 inch, \$2.00; 13 1/2 inch, \$2.50; 16 inch,  
\$3.00.

## Beams, Scale—

Scale Beams, List Jan. 12, '82. 50&10%  
Chatillon's No. 1 ..... 40%  
Chatillon's No. 2 ..... 50%  
Custer's ..... 33%&25

## Beaters—

### Egg—

Dover ..... \$ doz \$1.00@1.20  
Duplex (Standard Co.) ..... \$ doz \$1.00  
Dover (Standard Co.) ..... \$ doz \$1.00  
Duplex Extra Heavy (Standard Co.) ..... \$ doz \$3.50  
Bryant's ..... \$ gross \$14.00  
Double (H. & R. Mfg. Co.), \$ gro., No. 0  
\$12.00; No. 1, \$15.00; No. 2, \$26.00  
Easy (H. & R. Mfg. Co.) ..... \$ gro \$12.00  
Triple (H. & R. Mfg. Co.) ..... \$ gro \$16.50  
Spiral ..... \$ gro \$4.25 @ \$4.50  
Improved Acme (H. & R. Mfg. Co.) ..... \$ gro. \$9.50  
Silver & Co. .... \$ doz \$5.00

## Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;  
No. 2, \$2 ..... 20%

## Bells—

### Cow—

Common Wrought ..... 60&10%  
Western, Sargent's list ..... 70&10%  
Kentucky, "Star" ..... 70&10%  
Kentucky, Sargent's list ..... 70&10%  
Kentucky Durham ..... 70&10%  
Dodge, Genuine Kentucky ..... 70&10%  
Texas Star ..... 60&10@50&10&5%

### Door—

Gong, Abbe's ..... 33%&10%  
Gong, Yankee ..... 45&10%  
Gong, Barton's ..... 40&10@50%  
Crank, Brooks' ..... 50&10&2%  
Crank, Cone's ..... 10%  
Crank, Connell's ..... 20&10%  
Lever, Sargent's ..... 60&10%  
Lever, Taylor's Bronzed or Plated, net  
Lever, Taylor's Japaned ..... 25&10%  
Lever, R. & E. Mfg. Co.'s ..... 50&10&2%  
Pull, Brooks' ..... 50&10&2%

### Electric—

Wollensak's ..... 20%  
Bigelow & Dowd ..... 20%

### Hand—

Light Brass ..... 70&10@70&10&5%  
Extra Heavy ..... 70%  
White ..... 70%  
Silver Chime ..... 33%&10%  
Globe Cone's Patent ..... 25&10@35%

## Miscellaneous—

Call ..... 45&50%  
Farm Bells ..... 25&10%  
Steel Alloy Church and School Bells ..... 40%

## Bellows—

Blacksmiths' ..... 60&10&5@60&10&10%  
Molders' ..... 40&10@50%  
Hand Bellows ..... 40&10@50%

## Belted, Rubber—

Common Standard ..... 75@75&10%  
Standard ..... 70&5@70&10%  
Extra ..... 60&10@60&10&10%  
N.Y.B. & P. Co., Carbon ..... 60&60&5%  
N.Y.B. & P. Co., Diamond ..... 50@50&5%  
N.Y.B. & P. Co., Para ..... 40@40&5%

## Bench Stops—See Stops, Bench

## Benders and Upsetters,

### Tire—

Stoddard's Lightning Tire Upsetters ..... 15%  
Detroit Perfect Tire Bender ..... 15%  
Green River Tire Benders and Upsetters ..... 20%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.,  
see Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Adjusters, Blind.

## Blind Fasteners—See Fasteners, Blind.

## Blind Staples—See Staples, Blind.

## Blocks—

Cleveland Block Co., Mal. Iron. 60&60&10%  
Moore's Novelty, Mal. Iron ..... 60%  
Sure Grip Steel Tackle Blocks ..... 25%  
See also Machines, Hoisting.

## Bolts—

## Carriage, Machine, &c.—

Com. list June 10, '84 ..... 75&10&5@80%  
Genuine Eagle, Norway, list Oct. '84 ..... 80&5@50&10%  
Eagle, Norway, list Oct. '84 80&5@50&10%  
Phila. pattern, list Oct. 7, '84 ..... 80%  
R.B. & W., old list ..... 70%  
Machine, list Jan. 1, 1890 ..... 80&10%  
Bolt Ends, list Jan. 1, 1890 ..... 80&10%

## Door and Shutter—

Cast Iron Barrel, Square, &c. .... 70&10%  
Cast Iron Shutter Bolts ..... 70&10%  
Cast Iron Chain (Sargent's list) ..... 65&10%  
Ives' Patent Door Bolts. 60&10@60&10&5%  
Wrought Barrel ..... 70&10@75%  
Wrought Square ..... 70&10@75%  
Wrt Shutter, all iron, 60&10@60&10&10%  
Wrt Shutter, Brass Knob ..... 60&50&5%  
Wrt Shutter, Sargent's list ..... 60&10%  
Wrt Sunk Flush, Sargent's list ..... 60&10%  
Wrt Sunk Flush, Stanley's list. 50&10&5%  
Wrt K. Flush, Common ..... 55&10%

## Stove and Plow—

Stove ..... 60&10@60&10&5%  
Plow ..... 60&10&50@60&10&10%  
R. B. & W., Plow ..... 55%

## Tire—

Common, list Feb. 28, '83 ..... 65@65&5%  
Port Chester Bolt and Nut Company:  
Empire list Feb. 28, '83 ..... 65%  
Keystone, Philadel., list Oct. '84 ..... 80%  
Norway, Phila., list Oct. '84 ..... 75%  
American Screw Company ..... 75%  
Norway, Phila., list Oct. 16, '84 ..... 80%  
Phila., list Oct. 16, '84 ..... 80%  
Bay State, list Feb. 28, '83 ..... 65%  
R. B. & W., Philadel., list Oct. 16, '84 ..... 80%

## Borers, Tap—

Common and Ring ..... 20&10%  
Ives' Tap Borer ..... 33%&5%  
Enterprise Mfg. Co. .... 20%  
Clark's ..... 33%&35%

## Borax—

Per doz ..... 94@104%

## Boring Machines—See Ma-

chines, Boring.

## Bow Pins—See Pins, Bow.

## Boxes, Wagon—

Per doz ..... 24%

## Boxes, Miter.

Spiker's Excelsior, 3 in. \$7.50, 4 in  
\$8.50, 5 in. \$13.00, 6 in. \$15.00 ..... 20%

## Braces—

American Bit Brace and Tool Co.  
Nos. 10, 12, 20 ..... 60&10%  
Nos. 11, 21, 24, 27 ..... 70&10%  
Nos. 22, 23, 25 ..... 60&10&5%  
Nos. 26, 28, 36, 37 ..... 70&10&5%  
Amidon's  
Barker's Imp'd Plain ..... 75&10@80%  
Barker's Imp. Nickeled ..... 65&10@70%  
Ratchet ..... 75&10@80%  
Eclipse Ratchet ..... 40&10@50%  
Globe Jarrod ..... 40&40&10%  
Corner Brace ..... 40&40&10%  
Universal, 8 in. \$2.10; 10 in. \$2.25  
Buffalo Ball ..... \$1.10@1.15  
Barber's ..... 50&10%  
Saxton's  
Barker's Imp. Polished ..... 75&10@80%  
Barker's Imp. Nickeled ..... 65&10@70%  
Ratchet, Polished ..... 50&10@60%  
Ratchet, Nickeled ..... 40&10@50%  
Buffalo Ball ..... net, \$1.10@1.15  
Bartholomew's  
Nos. 25, 27 and 30 ..... 50&10@60&5%  
Nos. 11, 11 1/2, 19 ..... 70&70&5%  
Common Ball, American ..... \$1.00@1.10  
Fray's Genuine Spofford's ..... 50&50&10%  
Fray's Nos. 70 to 120, 81 to 123, 207 to 414  
50&10%  
Ives' New Haven Novelty ..... 70&70&5%  
New Haven Ratchet ..... 60&5@60&10%  
Barber Ratchet ..... 60&5%  
Barber's ..... 60&5%  
Spofford's ..... 60&5@60&10%  
P. S. & W. Co., Peck's Patent ..... 60%  
Rose & Johnson ..... 60%  
Davis Patent ..... 60&10%

## Brackets—

Shelf, plain ..... 65@70%  
Regular, list ..... 60&10@70&10%  
Shelf, fancy ..... 70@70&10%  
Sargent's list ..... 70@70&10%  
Other makes at a wide range of prices.  
Bradley Shelf Brackets ..... 70&10%

## Bright Wire Goods—See

Wire.

## Broilers—

Hen's Self, Inch ..... 9 10 9x11  
Beating, } Per doz. \$4.50 5.50 6.50  
New Haven ..... 60%  
Wire Goods Co. .... 65&10%  
Morgan Odorless ..... \$ doz. \$12.50  
Queen City ..... 33%&25

## Buckets, Well—

Galvanized—  
Hill's ..... \$ doz. 12 qt. \$4.25; 14 qt. \$5.25  
Iron Clad ..... \$ doz. 14 qt. \$4.25@4.50  
Helwig's Flat Iron Band ..... \$3.75  
Helwig's Wired Top ..... \$ doz \$4.00

## Bull Rings—See Rings, Bull.

## Butcher's Cleavers—See

Cleavers, Butcher's.

## Brush—

Wrought Brass ..... 30@30&10%  
Cast Brass, Tiebout's ..... 50%  
Cast Brass, Fast ..... 33%&10%  
Cast Brass, Loose Joint ..... 33%&10%

## Cast Iron—

Fast Joint, Narrow ..... 50&10&5@60%  
Fast Joint, Broad ..... 50&10@60%  
Loose Joint ..... 75@75  
Loose Joint, Japanned ..... 810%  
Loose Joint, Jap. Wrought  
Parliament Butts ..... 75@75  
Mayer's Hinges ..... 810%  
Loose Pin, Acorns ..... 75@75  
Loose Pin, Acorns, Japanned ..... 810%  
Loose Pin, Acorns, Japanned  
Loose Pin, Acorns, Japanned  
Plated Pins ..... 75@75

## Wrought Steel—

Fast Joint, Narrow ..... 50@50&10%  
Fast Joint, Broad ..... 40@40&10%  
Fast Joint, Ld. Narrow ..... 40@40&10%  
Loose Joint, Broad ..... 40@40&10%  
Table Butts, Back Flaps, &c. .... 40@40&10%  
Inside Blind, Regular ..... 40@40&10%  
Loose Blind, Light ..... 40@40&10%  
Loose Pin ..... 50@50&10%  
Bronzed Wrought Butts ..... 50@50&10%

## Cages, Bird—

Hendrix, Brass or Enameled ..... 50&10%  
Hendrix, Wood ..... 40&10%

## Callipers—See Compasses.

## Calks, Toe—

Gautier, One Prong, Blunt ..... 54% @ 6%  
Burke's One Prong, Blunt ..... 54% @ 6%  
Burke's, Two Prong, Blunt ..... 74% @ 8%  
Burke's, One Prong, Sharp ..... 64% @ 7%

## Can Openers—See

Openers.

## Cans, Milk—

S. S. & Co.: 5-gal., \$3.00; 8-gal., \$4.40;  
10-gal., \$4.75 each ..... 40&10%

## Cans, Oil—

Galvanized Blue Band, 5 gal., Tip-Top, \$ doz. \$12.00  
Galvanized Blue Band, 5 gal., Faucet, \$ doz. \$8.00  
Galvanized Blue Band, 1 gal., \$ doz. \$2.25  
Glass Oil, Friend ..... \$ doz. \$2.75

## Caps—

Percussion—  
Hicks & Goldmark's and Union Metallic  
Cartridge Co. ..... \$ 1000  
F. L. Waterproof, 1-10's ..... 35@37%  
E. B. Trimmed Edge, 1-10's ..... 47@50%  
E. B. Grnd. Edge, Cent. Fire, 1-10's ..... 47@50%  
Muskat. Waterproof, 1-10's ..... 50&53%  
G. D. ..... 27@30%  
S. B. Genuine Imported ..... 45%  
Eley's E. B. ..... 56@58%  
Eley's D Waterproof, Central Fire \$1.60

## Primers—

Berdan Primers, \$1.00 ..... 24%  
B. L. Caps (Sturtevant Shells) \$1.00 ..... 24%  
All other Primers, \$1.20 ..... 25%

## Cards—

Watson's Cotton, Wool, Horse and  
File, list January 28, 1891 ..... 25%

## Carpet Stretchers—

See Stretchers, Carpet.

## Cartridges—

Rim Fire Cartridges ..... 50@5&2%  
Fire Military ..... 25&25&2%  
Cent. Fire, Pistol and Rifle ..... 25&25&2%  
Cent. Fire, Military and Sporting ..... 15&5&2%  
Blank Cartridges, except 22 and 32 cal.,  
additional 10% to above discounts.  
Blank Cartridges, 22 cal., \$1.76 ..... 24%  
Blank Cartridges, 32 cal. \$3.50 ..... 24%  
Primed Shells and Bullets ..... 15&5&2%  
B. B. Caps, Round Ball, \$1.76 ..... 24%  
B. B. Caps, Con. Ball, Swgd., \$2.00 ..... 24%

## Carpet Sweepers—

See Sweepers, Carpet.

## Casters—

Bed ..... Brass ..... 55@55&10%  
Plate ..... Others ..... 60@60&10%  
Shallow Socket ..... 40&10%  
Deep Socket ..... 40&10%  
Marten's Patent (Phoenix) 45&10@50&10%  
Tucker's Patent, low list ..... 45%  
Payson's Anti-friction ..... 70@70&10%  
Payson's Truck ..... 60@60&10%  
Yale Casters, low list ..... 45%  
Yale, Gem ..... 35%  
Giant Truck Casters ..... 35%  
Stationary Truck Casters ..... 50&10%  
Socket Truck Casters ..... 50@60&10%  
Gwiner's Common Sense ..... 45%  
Gwiner's Hercules ..... 45%

## Cattle Leaders—

See Leaders, Cattle.

**Chalk Lines**—See Lines.  
**Cracks, Door**—Unity 50%  
**Chisels**—  
 Socket Framing and Firmer P. S. & W.  
 New Haven 75¢10¢75¢10¢10%  
 Witherby 75¢10¢75¢10¢10%  
 Mix  
 Ohio Tool Co. 75¢75¢5%  
 Douglass 75¢75¢5%  
 Buck Bros. 30%  
 Merrill 60¢10¢60¢10¢25%  
 L. & J. White 30%30¢5%  
**Tanged and Miscellaneous.**  
 Tanged Firmers 50¢50¢10%  
 Butchers' 4.75¢\$5.00 to 2  
 Spear & Jacksons' 5¢ to 2  
 Buck Bros. 30%30¢5%  
 Cold Chisels, fair quality, 14¢10¢  
**Chucks**—  
 Beach Pat. each, \$8.00 20%  
 Morse's Adjustable, each, \$7.00, 20¢20¢5%  
 Danbury, each, \$6.00, 30¢30¢5%  
 Syracuse, Balz Pat. 35%  
 Graham Patent 35%  
 Skinner's Patent Chucks 35%  
 Combination Lathe Chucks 35%  
 Universal Lathe Chucks 40%  
 Independent Lathe Chucks 40%  
 Drill Chucks 15%  
 Union Mfg. Co.  
 Victor 35.50, 25%  
 Combination 40%  
 Universal 40%  
 Independent 40%  
**Churns**—  
 Tiffin Union, each, 5 gal. \$3.25; 7 gal. \$3.75; 10 gal. \$4.40  
 McDermald Star Barrel Churn, each 6 gal., \$2.60; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.  
**Clamps**—  
 R. I. Tool Co.'s Wrought Iron 25%  
 Adjustable, Cincinnati 15¢15¢5%  
 Adjustable, Hammers 15¢15¢5%  
 Adjustable, Stearns' 30¢30¢10%  
 Stearns' Adjustable Cabinet and Corner 30¢30¢10%  
 Cabinet, Sargent's 70¢10%  
 Carriage Makers', Sargent's 75¢75¢5%  
 Carriage Makers', P. S. & W. Co. 40¢10%  
 Eberhard Mfg. Co. 40¢50¢10%  
 Warner's 40¢10¢40¢10%5%  
 Saw Clamps, see Vises, Saw Filers.  
 Carpenter's, Cincinnati 25¢10%  
 Barnes' Machinists' Clamps 33%4%  
**Cleavers, Butchers'**—  
 Bradley's 25¢30%  
 L. & J. White 20¢5%  
 Beatty's 40¢40¢5%  
 New Haven Edge Tool Co. 40%  
 P. S. & W. 35%40¢35%4%  
 Foster Bros. 30%  
 Schulte, Lohoff & Co. 40¢40¢5%  
**Clips**—  
 Norway, Axle, 1/4 & 5-16 55¢5¢5%  
 2d grade Norway Axle, 1/4 & 5-16 65¢5%  
 Superior Axle Clips 60¢5¢5%  
 Norway Spring Bar Clips, 5-16 80¢5¢5%  
 Wrought Iron Felloe Clips 1/4 & 5-16 5¢  
 Steel Felloe Clips 1/4 & 5-16 5¢  
 Baker Axle Clip 25%  
**Cloth and Netting, Wire**—  
 See Wire, &c.  
**Cockeyes**—50%  
**Cocks Brass**—  
 Hardware list 60¢2%  
**Coffee Mills**—See Mills, Coffee.  
**Collars**—  
 Chapman Mfg. Co. any new list 40%  
 Medford Fancy Goods Co. 40¢10¢50%  
 Embossed, Gift, Pope & Steven's list 30¢1%  
 Leather, Pope & Steven's list 40%  
 Brass, Pope & Steven's list 40%  
**Combs, Curry**—  
 Fitch's 10¢10¢10%50¢10%10%  
 Rubber, per doz. 10¢10%  
 American Curry Comb Co. 35%  
 Kohler's Magic Oscillating 40¢, \$2.00  
 Kohler's Humane 40¢, \$1.75  
**Compasses, Dividers, &c.**  
 Compasses, Calipers, Dividers, 70¢70¢10%  
 Bemis & Call Co.'s  
 Dividers 65%  
 Compasses 50¢5%  
 Calipers, Inside or Outside 65%  
 Calipers, Wing 65%  
 Calipers, Double 65%  
 Calipers, Call's Patent Inside 65%  
 Excelsior 60%  
 Stevens & Co.'s 25¢10%  
 Starrett's  
 Spring Calipers and Dividers 25¢10%  
 Lock Calipers and Dividers 25%  
 Combination Dividers 25%  
**Coolers, Water**—  
 S. S. & Co.: 2-gal., \$2.00; 3-gal., \$2.50;  
 4-gal., \$2.75; 6-gal., \$3.40 each 33%4%  
**Coopers' Tools**—  
 See Tools, Coopers'.  
**Cord**—Sash  
 Common 84¢99¢  
 Patent, good quality 10¢11%  
 White Cotton Braided, fair 23¢24%  
 Common Russia Sash 12¢13%  
 Patent Russia Sash 13¢14%  
 Cable Laid Italian Sash 18¢20%  
 India Cable Laid Sash 11¢12%  
 Silver Lake  
 A quality, White, 50¢ 25%  
 A quality, Drab, 55¢ 25%  
 B quality, White, 30¢ 10%  
 B quality, Drab, 35¢ 10%  
 Sylvan Spring, Extra Braided, White 34%  
 Sylvan Spring, Extra Braided, Drab 34%  
 Semper Idem, Braided, White 27¢28%  
 Egyptian, Ede Hemp, Braided 28%  
 Massachusetts, White 29%  
 Samson  
 Braided, White Cotton 37¢  
 Braided, Drab Cotton 42¢  
 Braided, Italian Hemp 40%  
 Braided, Linen 66%  
 Fate's Solid Braided—  
 Hercules, White 25%  
 Hercules, Drab 30%  
 Economy, Drab 27%  
 Economy, White 22%  
 Ossawaun Mills  
 Braided, Giant, White, 1/4 & 3/8 20%  
 Braided, Giant, Drab and Fancy 10%  
 1/4 & 5/8 10%

Braided, Crown White, 1/4 & 5/8 50%  
 Braided, Crown Drab and Fancy, 1/4 & 5/8 50%  
**Wire Picture**—  
 Braided or Twisted 80¢50¢15%  
**Corkscrews**—See Screws, Cork.  
**Corn Knives and Cutters**—  
 See Knives, Corn.  
**Crackers Nut**—  
 Table (H. B. Mfg. Co.) 40%  
 Blake's Pattern, 1/2 doz. \$2.00 10%  
 Turner & Seymour Mfg. Co. 50%  
 Acme  
 Janned, 1/2 gro., \$30 50%  
 Nickel Plated, 1/2 gro. \$30 10%  
**Cradles**—  
 Grain 50¢2¢50¢5¢2%  
**Crayons**—  
 White Crayons, 1/2 gross 7¢8¢  
 D. M. Stewart Mfg. Co.  
 Metal Workers', 1/2 gross, \$1.75 25%  
 Rolling Mill, 1/2 gross, 2.00 25%  
 Railroad, 1/2 gross, 2.00 25%  
 Soapstone Pencils, 1/2 gross, 1.00 25%  
 See also Chalk.  
**Creamery Pails**—See Pails, Creamery.  
**Crow Bars**—See Bars, Crow.  
**Curry Combs**—  
 See Combs, Curry.  
**Curtain Pins**—  
 See Pins, Curtain.  
**Cutters**—  
**Meat**—  
 Dixon's, 1/2 doz. 40¢10¢5%  
 Nos. 1 2 3 40¢10¢5%  
 \$14.00 \$17.00 \$19.00 \$30.00  
 Woodruff's, 1/2 doz. 40¢10¢5%  
 Nos. 1 2 3 40¢10¢5%  
 \$100 150 180  
 \$15.00 \$18.00  
 Hale's, 1/2 doz. 11 12 13 70%  
 Nos. 1 2 3 27¢00 \$33.00 \$45.00  
 American 1 2 3 30%  
 Nos. 1 2 3 30%  
 Each \$5 \$7 \$10 \$25 \$50 \$80  
 Enterprise 25%  
 Nos. 1 2 3 42 42 42  
 Each \$3 \$2.50 \$4 \$6 \$15  
 Little Giant, 1/2 doz. 40¢10¢50%  
 Nos. 305 310 320 322 322  
 \$35.00 \$44.00 \$44.00 \$72.00 \$98.00  
 Triumph No. 505, 1/2 doz., \$21.00, 25¢30%  
 Miles' Challenge, 1/2 doz., 45¢45¢10%  
 Nos. 1 2 3  
 \$22.00 \$30.00 \$40.00  
 Home No. 1, 1/2 doz., \$28.00, 55¢10%  
 Draw Cut, each:  
 Nos. 1 2 3 8  
 \$50 \$75 \$80 \$225 20¢25%  
 Beef Shavers (Enterprise) 20%  
 Chadborn's Smoked Beef Cutter, 1/2 doz., \$66.00  
**Slaw and Kraut**—  
 Tucker & Dorsey Mfg. Co.:  
 Slaw Cutters, 1 Knife, 1/2 gross, \$21.00  
 Slaw Cutters, 2 Knife, 1/2 gross, \$36.00  
 Kraut Cutters 40%  
**Tobacco**—  
 Champion 20¢10¢30%  
 All Iron 1/2 doz., \$4.25  
 Nashua Lock Co.'s, 1/2 doz., 50¢55%  
 Wilson's 55%  
 Sargent's 1/2 doz., \$24.00, 55¢10%  
 Acme 1/2 doz., \$20.00, 40%  
**Washers**—  
 Smith's Pat. 1/2 doz., \$12.00, 20¢10%10%  
 Johnson's 1/2 doz., \$11.00, 33%4%  
 Penny's, 1/2 doz., Pol. \$14; Jap'd, \$16, 55%  
 Appleton's 1/2 doz., \$18.00, 60¢10%  
 Bonney's 30¢10%  
 Cincinnati 25¢10%  
**Diggers, Post Hole, &c.**—  
 Samson 1/2 doz., \$34.00 25¢25¢10%  
 Fletcher Post Hole Augers, 1/2 doz. 20¢20¢10%  
 Eureka Diggers 1/2 doz. \$12.00 \$13.00  
 Vaughan's Post Hole Auger, 1/2 doz. \$8.50 \$9.50  
 Kohler's Little Giant 1/2 doz., \$18.00  
 Kohler's National 1/2 doz., \$14.00  
 Kohler's Invinible 1/2 doz., \$12.00  
 Kohler's New Champion 1/2 doz., \$8.00  
 Schielder 1/2 doz., \$18.00  
 Cronk's Post Bars, 1/2 doz., \$60.00, 50¢50¢50¢10%  
 Gibbs' Post Hole Digger 1/2 doz., \$15.00  
 Gibbs' National 1/2 doz., \$12.00  
 Gibbs' Columbia 1/2 doz., \$13.00  
 Gibbs' Imperial 1/2 doz., \$7.50  
 Shimer's Hollow Handle 1/2 doz., \$24.00, 50%  
 Gem, Improved 1/2 doz., \$9.00 \$10.00 20%  
**Dividers**—See Compasses.  
**Dog Collars**—See Collars, Dog.  
**Door Checks**—  
 See Checks, Door.  
**Door Springs**—  
 See Springs, Door.  
**Drawers**—  
 Money, 1/2 doz. \$18¢20¢  
 Waddell's Improved, 1/2 doz. \$15.00  
**Drawing Knives**—  
 See Knives, Drawing.  
**Drills and Drill Stocks**—  
 Blacksmiths' each \$1.75  
 Blacksmiths' Self-Feeding, each \$7.50, 20%  
 Prent, P. S. & W. 40¢10%  
 Breast, Wilson's 30¢5%  
 Breast, Weston's 20¢25%  
 Breast, Bartholomew's each \$2.50 25%  
 Ratchet, Merrill's 25¢10¢40%  
 Ratchet, Ingersoll's 25%  
 Ratchet, Parker's 20¢20¢10%  
 Ratchet, Whitney's 20¢10%  
 Ratchet, Weston's 20¢25%  
 Ratchet, Moore's Triple Action 25¢50%  
 Ratchet, Curtis & Curtis 30%  
 Whitney's Hand Drill, Plain, \$11.00  
 Adjustable, \$12.00 20¢10%  
 Automatic Boring Tools \$1.75 \$1.85  
 Chipconer Automatic Drill 20¢10%  
 Goodell Automatic Drills 40¢5%  
**Twist Drills**—  
 Cleveland 50¢10¢10%  
 Diamond, W. & B. 50¢10¢10%  
 Graham's Pat. Groove Shank 50¢10¢10%  
 Morse 50¢10¢10%  
 New Process 50¢10¢10%  
 Standard 50¢10¢10%  
 Syracuse (Metal List) 50¢10%

**Drill Bits or Bit Stock**—  
 Drills—See Augers and Bits.  
**Drill Chucks**—See Chucks.  
**Dripping Pans**—  
 See Pans, Dripping.  
**Drivers, Screw**—  
 Douglass Mfg. Co. 20¢20¢10%  
 Disston's 50%  
 Stanley R. & Co.'s 30%  
 No. 64, Varnished Handles 65¢10%  
 No. 86 70¢10%  
 Sargent & Co.'s  
 No. 1, Forged Blade 60¢10¢10%  
 Nos. 20, 40 and 60 60¢10¢10%  
 P. S. & W. 70%  
 Knapp & Corlies  
 No. 1 60¢20¢70%  
 No. 2 60¢10¢10%70¢5%  
 No. 3 60¢5¢60¢10%  
 Nos. 4 and 00, Acme and Ideal 50¢5%  
 Stearns' 50¢10¢5%  
 Gay & Parsons 25¢10¢5%  
 Champion 25%  
 Clark's Pat. 30¢33%4%  
 Ellrich's Socket and Ratchet 25¢10%  
 Allard's Spiral, new list 25%  
 Kolb's Common Sense, 1/2 doz., \$8.00, 25¢10%  
 Syracuse Screw Driver Bits 30¢30¢5%  
 Screw Driver Bits, 1/2 doz., 50¢5%  
 Screw Driver Bits, 1/2 doz., \$6.25  
 Fray's Hol. H. die Sets, No. 3, \$12.00, 45%  
 Cincinnati 25¢10%  
 Brace Screw Drivers 25%10%  
 Buck Bros.' Screw Driver Bits 27%4%5%  
 Goodell's Automatic 50%  
 Mayhew's H. die Handle 50%  
 Mayhew's Monarch 45¢10%  
 C. T. Williamson Wire Novelty Co. 50%  
**Egg Beaters**—See Beaters, Egg.  
**Egg Poachers**—  
 See Poachers, Egg.  
**Electric Bell Sets**—  
 See Bells, Electric.  
**Emery**—No. 4 to No. 54 to Flour, CF.  
 46 gr. 150 gr. F.F.F.  
 Kegs, 1/2 doz. 4 1/2 5 2 1/2 2 1/2  
 1/2 doz. 4 1/2 5 2 1/2 2 1/2  
 1/2 doz. 4 1/2 5 2 1/2 2 1/2  
 10-1/2 cans, 10 6 6 1/2 3 1/2  
 10-1/2 can. 10 6 6 1/2 3 1/2  
 than 10-1/2 10 6 7 1/2  
**Enameled and Tinned Ware**—See Ware, Hollow.  
**Escutcheon Pins**—  
 See Pins, Escutcheon.  
**Escutcheons**—  
 Door Lock, Same dia. as Door Locks.  
 Brass Thread 60¢60¢10%  
 Wood 25%  
**Expanded Metal**—  
 List No. 5.  
 Lathing 10%  
 Fencing, Painted Sheets 20%  
 Netting, Painted Sheets 20%  
 Door Metal, Galvanized 25%  
 Window Guards, Painted 15%  
 Tree Guards, Painted 15%  
**Extractors, Lemon Juice**—  
 See Squeezers, Lemon.  
**Fasteners, Blind**—  
 Mackrell's, 1/2 doz., \$1.00, 20¢20¢10%  
 Van Sand's Screw Pat. \$15 1/2 gr. 80¢10%  
 Van Sand's Old Pat. \$15 1/2 gr. 55¢10%  
 Austin & Eddy No. 2008 1/2 gr. \$9.00  
 Security Gravity 1/2 gr. \$9.00  
 Zimmerman's 50¢10%  
**Faucets**—  
 Fenn's 40%  
 Fenn's Cork Stops 35%4%  
 Star's Pat. Petroleum 60%  
 B. & L. B. Co.  
 West's Lock, Open and Shut Key 50%  
 Star, Metal Plug, new list 40%  
 Lockport, Metal Plug, reduced list 60%  
 Metallic Key, Leather Lined 60¢10%  
 Cork Lined 60¢10¢10%  
 Burnside's Red Cedar 70¢5¢70¢10%  
 Burnside's Red Cedar, bbl. lots 50¢10%  
 John Sommers' Peerless Best Block Tin Key 40%  
 LXL, list quality, Cork Lined 50%  
 Diamond's Lock Red Cedar (in boxes) 40%  
 Perfecto Lock Red Cedar (in boxes) 40%  
 Boss Metallic Key 40%  
 Reliable Cork Lined 60%  
 O. K. Western Pattern Cork Lined 50%  
 No Brand, Red Cedar (in bbls.) 50¢10%  
 Western Pattern Metal Key 40%  
 No Brand Metal Key 60%  
 Self Measuring Enterprise, 1/2 doz., \$36.00 20%  
 Lane's 1/2 doz., \$36.00 25¢10%  
**Felice Plates**—  
 See Plates, Felice.  
**Fibre Ware**—See Ware, Fibre.  
**Fibre Wheels**—  
 Derby and Cincinnati 45¢5%  
 Brewster 60¢5%  
**Files**—  
**Domestic**—  
 Nicholson Files, Rasps, 20¢60¢10%5%  
 Nicholson (X.F.) Files 60¢10¢10%  
 Nicholson's Royal Files (Seconds) 75%  
 (extra prices on certain sizes.)  
 American 60¢10¢60¢10%10%  
 G. & H. Barnett (Black Diamond) 60¢10¢60¢10%5%  
 Arcade 60¢10¢60¢10%5%  
 Eagle 60¢10¢60¢10%70%  
 Other makers, best brands 60¢10¢60¢70%  
 Fair brands 70¢10¢70¢10%10%  
 Second quality 80¢80%  
 Heller's Horse Rasps 50¢10%  
 McCaffrey's Horse Rasps 50¢10%  
 Chelsea Horse Rasps, Hand Cut 50¢10%  
 Arcade Horse Rasps 60¢10¢60¢10%5%  
 Trojan Horse Rasps 60¢10%  
**Imported**—  
 Butcher 1/2 t. 20%  
 Strbb 1/2 list 25¢40%

**Fixtures Grindstone**—  
 Sargent's Patent 70¢10%  
 Reading Hardware Co. 30¢10%  
 P. S. & W. Co. 50¢10%  
 Moore's 55%  
**Fluting Machines**—  
 See Machines, Fluting.  
**Fluting Scissors**—  
 See Scissors, Fluting.  
**Fodder Squeezers**—  
 See Squeezers, Fodder.  
**Forks**—  
 Hay, Manure, &c. Asso. List 70¢70¢5¢2%  
 Hay, Manure, &c. Phila. List 90¢60¢10%2%  
 Plated, see Spoons.  
**Frames—Saw**—  
 White Vermont 1/2 gro. \$9.00 \$10.00  
 Red, Polished and Varnished 1/2 doz. \$1.50, 25%  
**Screen, Window and Door**—  
 Porter's Pat. Window and Door Frame 38%10%  
 Warner's Screen Corner Irons 33%4%10%  
 Stearns' Frames and Corners 25¢25¢10%  
 Portland 40¢40¢5%  
 Phillips' Window Screen Frames 50¢50%5%  
 Bonanza Window Screens 50¢50¢10%  
 Empire Fancy Screen Doors, 1/2 doz. \$12  
**Freezers Ice Cream**—  
 White Mountain 60¢60¢5%  
 Granite State 60¢60¢5%  
 Arctic 70¢70¢5%  
 American 60%  
 Buffalo Champion 65¢65¢5%  
 Shepard's Lightning 65¢65¢5%  
 Gam 65%  
 Bilzard 70%  
 Double Action Crown 60%  
 Crown 60%  
 Star 60%  
 Peerless 60¢10%  
 Giant 60%  
 Zero 70%  
 Boss and Peerless 60¢10%10%10%  
 Keystone, P. D. & Co., each, \$1.60, 20%  
 Standard 60¢60¢5%  
 Standard Double Action 60¢60¢5%  
 Good Luck 65¢65¢5%  
 Model 60¢60¢5%  
 Confectioners' Machine 50%  
**Fruit and Jelly Presses**—  
 See Presses, Fruit and Jelly.  
**Fruit Pickers**—  
 See Pickers, Fruit.  
**Fry Pans**—See Pans, Fry.  
**Funnels**—  
 Gerhardt's Perfection, Standard and Globe, 1/4, 1 gro., 10% 2 to 5 gro. 20%  
 5 to 10 gro. 30%  
 Copper, 1/2 to 6 doz. 15¢ 6 to 12 doz. 20%  
 over 12 doz. 25%  
**Furnaces, Soldering**—  
 Burgess No. 3 Gen. tin reservoir \$7.00  
 Burgess No. 3 Gen. Copper reservoir \$8.50  
 Clayton & Lambert No. 1 Fire-Pot, complete \$8.00  
**Fuse**—Dis. 12¢15% 1/2 m 1000 ft  
 Common Hemp Fuse, for dry ground \$2.70  
 Common Cotton Fuse, for dry ground 2.85  
 Single Taped Fuse, for wet ground 3.85  
 Double Taped Fuse, for very wet gr. 5.80  
 Triple Taped Fuse, for very wet gr. 5.80  
 Small Gutta Percha Fuse, for water 7.50  
 Large Gutta Percha Fuse, for water 12.00  
**Gates Molasses**—  
 Stebbin's Pattern 80¢80¢5%  
 Stebbin's Genuine 60¢10%10%  
 Stebbin's Timed Ends 40¢10%  
 Lincoln's Pattern 70¢70¢10%  
 Weeds' 20¢10%  
 Boss, 1/2 doz. 60¢10%10%  
 No. 1, \$7; No. 2, \$8; No. 3, \$9; No. 4, \$10 60¢10%10%  
**Gauges**—  
 Marking, Mortise, &c. 60¢10%  
 Starrett's Surface, Center and Scratch 25¢10%  
 Stanley R. & L. Co.'s Butt and Rabbit Gauge 20¢10%  
 Barrett's Comb. Roller Gauge 40¢  
 Hoague & Peck's Champion Gauge—  
 With Scale 1/2 doz. \$5.00  
 Without Scale 1/2 doz. \$4.00  
 Wire, Wheeler, Madden & Co. 10%  
 Wire, Morse's 25%  
 Wire, Brown & Sharpe's 10¢20%  
 Wire, P. S. & W. Co. 10¢10%  
**Gimlets**—  
 Nail and Spike 50¢10%5%  
 Eureka Gimlets 60¢10%  
 Diamond Gimlets 1/2 gr \$5.00  
 Double Cut, Shepardson's 45¢45¢5%  
 Doub e Cut, Ives 60¢80%  
 Double Cut, Douglass' 40¢10%  
**Glue**—  
 Le Page's Liquid 25¢25¢5%  
 Upton's Liquid 25%  
 Improved Process 25%  
 Dodd's Liquid Glue 25¢25¢5%  
**Glue Pots**—See Pots, Glue.  
**Grease, Axle**—  
 Frasers' 1/2 Reg 1/4 4¢, Pall 1/2 5¢  
 Frasers', in boxes 1/2 gr \$9.50  
 Dixon's Everlasting, in bxs. 1/2 doz 1.60  
 Dixon's Everlasting 1/2 doz 1.20  
 Lower grades, special brands 1/2 gr \$5.50 \$7.00  
 Axleline, tin boxes 1/2 gross \$12.00  
 English Coach, wooden boxes 1/2 gross \$8.50  
 English Coach, 5-b tin pails 1/2 doz. \$3.50  
 Tiger, wooden boxes 1/2 gross \$8.50  
 Tiger, 5-b tin pails 1/2 doz \$2.85  
**Grindstones**—  
 Family, regular list 60%  
 Family, Cleveland Stone Co. 20%  
**Grindstone Fixtures**—  
 See Fixtures, Grindstone.  
**Gun Powder**—See Powder.  
**Hack Saws**—See Saws.  
**Hafis, Aul**—  
 Sewing, Brass Fer. 1/2 gr. \$1.75  
 Pat. Sewing, Short 1/2 doz. 45¢50%  
 Pat. Sewing, Long 1/2 doz \$1.20  
 Pat. Peg, Plain Top 1/2 doz. 40¢45%  
 Pat. Peg, Leather Top 1/2 doz 45¢50%

**Halters**  
 Covert's Rope, Jute.....60&10&10&25  
 Covert's Rope, 7-16 in. Jute.....70&25  
 Covert's Rope, 1/4 in. Hemp.....50&25  
 Covert's Adj. Rope Halters.....40&25  
 Covert's Hemp Horse and Cattle.....50&10&25  
 Covert's Jute Horse Ties.....70&25  
 Covert's Jute Cattle Ties.....70&10&25  
 Covert's Adj. Web Halters.....35&25  
 Covert's Saddlery Works Halters.....35&45  
 Covert's Saddlery Works Horse Ties.....35&45  
 Covert's Cattle Ties.....35&45  
 Covert's Saddlery Works Handy Web Halters.....35&45

**Hammers**  
**Handled Hammers**  
 Maydole's, list Dec. 1, '85.....25&10&35  
 Buffalo Hammer Co.....50&10  
 Humason & Beckley.....50&10  
 Atha Tool Co.....40&10  
 Verree.....40&10  
 C. Hammond & Son.....40&10  
 Fayette R. Plumb.....40&10  
 Artisans' Choice, A. E. Nail.....40&10  
 Regular V. & P. A. E. Nail.....40&10  
 Horseshoe Turning Hammers.....50&10  
 Other Hammers.....50&10  
 Cheney's Claw.....40&10  
 Cheney's Machinist's & Riveting.....50&25  
 Magnetic Tack, Nos. 1, 2, 3, 1.25, 1.50 & 1.75.....30&10  
 Nelson Tool Works.....40&10  
 Warner & Beck, new list.....25&10  
 Peck, Stow & Wilcox.....35&40  
 Sargent's.....40&10

**Heavy Hammers and Sledge**  
 3 lb and under.....40  
 3 to 5 lb.....75&10&75&10  
 Over 5 lb.....80  
 Wilkinson's Smiths.....10&10

**Handcuffs and Leg Irons**  
 See Police Goods.

**Handles**  
**Cross-Cut Saw Handles**  
 Atkins, new list.....40  
 Champion.....15  
 Ely's "perfection".....40  
 Sensible.....40

**Iron, Wrought or Cast**  
 Door or Thumb.....40  
 Nos. 0 1 2 3 1.25 1.50 1.75  
 Per doz.....\$0.90 1.00 1.08 1.35 1.50  
 Roggin's Latches.....40  
 Bronze Iron Drop Latches.....40  
 Jap'd Store Door Handles.....1.25  
 Plate, 1.10; no plate, \$0.88.....net  
 Barn Door, per doz.....1.40  
 Chest and Lifting.....70&70&10

**Wood**  
 Saw and Plane.....40&10&50  
 Hammer, Hatchet, Axe, &c.....40&40&50  
 Hickory Firmer Chisel, ass'd.....40  
 Hickory Firmer Chisel, large.....40  
 Apple Firmer Chisel, ass'd.....40  
 Apple Firmer Chisel, large.....40  
 Socket Firmer Chisel, ass'd.....40  
 Socket Framing Chisel, ass'd.....40  
 J. B. Smith & Co.'s Pat. File.....50  
 File, assorted.....40  
 Auger, assorted.....40  
 Auger, large.....40  
 Pat. Auger, Ives.....40  
 Pat. Auger, Douglas.....40  
 Pat. Auger, Swan's.....40  
 Hoe, Rake, Shovel, &c.....40

**Hangers**  
 Barn Door, old patterns.....70  
 Barn Door, New England.....70  
 Samson Steel Anti-Friction.....55  
 Orleans Steel.....55  
 Hamilton Wrought Steel Track.....55  
 Champion.....60  
 Climax Anti-Friction.....55  
 Zenith for Wood Track.....55  
 Sterling.....50  
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....50  
 Kidder's.....50  
 Boss.....50  
 Best Anti-Friction.....50  
 Duplex (Wood Track).....50  
 Terry's Modern.....50  
 Terry's Ideal.....50  
 Terry's Solid.....50  
 Terry's Shield.....50  
 Terry's Wrought Single Steel.....50  
 Cronk's Patent Steel Covered.....50  
 Carrier Steel Anti-Friction.....50  
 Richards.....50  
 Lane's New Standard.....50  
 Lane's Standard.....50  
 Lane's Parlor.....40  
 Warner's Patent.....50  
 Stearns' Anti-Friction.....50  
 Stearns' Challenge.....50  
 Cincinnati Nos. 1, \$2.25; 3, \$2.50; 4, \$2.50.....50  
 Paragon Nos. 5, 6, 7 and 8.....20  
 Crescent.....20  
 Nickel Steel, Nos. 0, \$3; 1, \$2; 2, \$1.50.....40  
 Chicago Anti-Friction.....40  
 Star.....40  
 Barry.....40  
 Interstate.....40  
 Pendulum, Payson's.....40  
 Moody.....40  
 Economy, \$6.00.....50  
 Perfection.....50  
 Lundy Steel Parlor.....40  
 Matchless.....50  
 Magic.....40  
 Wild West.....40  
 Moore's Elevator.....35  
 Moore's Baggage Car Door.....35  
 Moore's Railroad.....55

**Harness Snaps**—See Snaps.  
**Hatchets**  
 American Axe and Tool Co.....40 & 10  
 Blood's.....40 & 10  
 Hunt's.....40 & 10  
 Hurd's.....40 & 10  
 Maun's.....40 & 10  
 Peck's.....40 & 10  
 Underhill's.....40 & 10  
 Fayette R. Plumb.....40 & 10  
 C. Hammond & Son.....40 & 10  
 Kelly's.....40 & 10  
 Buffalo Hammer Co.....40 & 10  
 Sargent's & Co.....40 & 10  
 P. S. & W. Co.....40 & 10  
 Schulte, Lohoff & Co.....40 & 10  
 Ten Eyck Edge Tool Co.....40 & 10  
 Collins.....40 & 10

**Hay and Straw Knives**  
 See Knives.

**Hinges**  
**Blind Hinges**

Parker.....75&25  
 Huffer.....50  
 Clark's, Nos. 3, 5, 40 and 50.....80  
 Clark's Mortise Gravity.....50  
 Sargent's, Nos. 1, 3, 5, 11, 12, 13, 75&10  
 Reading's Gravity.....75&10  
 Shepard's.....75&10  
 Noiseless.....75&10  
 Niagara.....80  
 Clark's Genuine Pattern.....80  
 O. S. Lull & Porter.....75&10  
 Acme, Lull & Porter.....75  
 Queen City Reversible.....70&10  
 Clark's, Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3.....75&10  
 North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....10

**Gate Hinges**

Western.....40  
 N. E.....40  
 N. E. Reversible.....40  
 N. Y. State.....40  
 Automatic.....40  
 Shepard's.....40

**Spring Hinges**

Geer's Spring and Blank Butts.....40  
 Union Spring Hinge Co's list.....40  
 March, 1886.....20  
 Barker's Double Acting.....25  
 Union Mfg. Co.....25  
 Bommer's Japanned.....35  
 Bommer's All other Kinds.....30  
 Buckman's.....30  
 Chicago.....30  
 Bardley's Patent Checking.....15  
 Acme.....15  
 U. S.....25  
 Empire and Crown.....20  
 Hero and Monarch.....55  
 American, Gem and Star.....20  
 Oxford.....20  
 Royal.....60  
 Reliable.....60  
 Champion.....60  
 No. 10 Matchless.....60  
 No. 25 Unbreakable.....60  
 J. G. C. Covered, per gro, \$80.....60  
 Samson.....60  
 Wiles, No. 1, per gro, \$16; No. 2, \$13.....60  
 Devore, No. 1.....60  
 Rex.....60  
 Freeport.....60  
 New Idea Nos. 1 and 10.....60  
 American Obl. Acting.....45  
 Ideal No. 3.....45  
 Stearns' Noiseless Floor Hinge, per set, \$5.00.....20  
 Extra 50 & 10 % often given.

**Wrought Iron Hinges**

List February 14, 1891.  
 Strap and T.....50  
 Corrugated Strap and T.....50  
 Screw Hook and Eye.....40  
 Strap.....40  
 Screw Hook and Eye.....40  
 Rolled Blind Hinges, Nos. 32 and 34.....50  
 Rolled Blind Hinges, Nos. 252 and 234.....50  
 Rolled Plate.....50  
 Rolled Raised.....50  
 Plate Hinges (8, 10 & 12 in., per doz.....50  
 "Providence" 1 over 12 in., per doz.....40

**Hoes**  
**Eye**

D. & H. Scovill.....20  
 Lane's Crescent Planters' Pattern.....45  
 Lane's Razor Blade, Scovill Pattern.....30  
 Maynard, S. & O. Pat.....45  
 Sandusky Tool Co., S. & O. Pat.....40  
 Am. Axe and Tool Co., S. & O. Pat.....40  
 Chattanooga Tool Co., S. & O. Pat.....40  
 Grub.....40

**Handled**

Garden, Mortar, &c.....70  
 Planter's Cotton, &c.....70  
 Warren Hoe.....60  
 Magic.....40

**Hog Rings and Ringers**  
 See Rings and Ringers.

**Holisting Apparatus**  
 See Machines, Holisting.

**Hollow-Ware**  
 See Ware, Hollow.

**Holders**  
**Bag**

Sprengle's Pat.....40  
 Extension.....40  
 Barber's, per doz.....40  
 Ives, per doz.....40  
 Diagonal.....40  
 Angular.....40

**File and Tool**

Bals Pat.....40  
 Nicholson File Holders.....25  
 Sash  
 Motley's Adj. Sash, Medium Size.....40

**Hooks**  
**Cast Iron**

Bird Cage, Sargent's list.....40  
 Bird Cage, Reading.....40  
 Clothes Line, Sargent's list.....40  
 Clothes Line Moore's.....40

**Clothes Line, Reading list**  
 60&10&80&10&10  
**Ceiling, Sargent's list**  
 55&10&10  
**Harness, Reading list**  
 55&10&10  
**Coat and Hat, Sargent's list**  
 55&10&10  
**Coat and Hat, Reading**  
 50&10&50&10&10  
**Coat and Hat, Moore's**  
 70

**Wrought Iron**

Cotton.....40  
 Cotton Pat. (N. Y. Mallet and Handle).....40  
 Tasse and Picture, T. & S. Mfg. Co.....50  
 Wrought Staples Hooks, &c.....50

**Wire**

Wire Coat and Hat, Gem, list April, 1886.....60  
 Wire Coat and Hat, Miles, list April, 1886.....60  
 Indestructible Coat and Hat.....40  
 Wire Coat and Hat, Standard.....60  
 Steady Hat and Coat.....50  
 Steady Ceiling Hooks.....50  
 Atlas, Coat and Hat.....65  
 Williams' Bird Cage Hooks, list April, 1886.....40  
 Bright Wire Goods—See Wire.

**Miscellaneous**

Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25  
 Nolin's No. 2.....40  
 Bush.....65  
 Whitetree—Patent.....65  
 Hooks and Eyes—Malleable Iron.....70  
 Hooks and Eyes—Brass.....60  
 Fish Hooks, American.....60  
 Bench Hooks—See Bench Stops.

**Horse Nails**—See Nails, Horse

**Horse Shoes**  
 See Shoes, Horse.

**Hose, Rubber**

Competition, Fair quality.....75  
 Competition, Low Grade.....80  
 Standard.....70  
 Extra.....60  
 N. Y. B. & P. Co., Para.....25  
 N. Y. B. & P. Co., Extra.....40  
 Cotton Garden, 1/4 in., coupled: Fair Quality, per doz.....70  
 Good Quality, per doz.....80

**Huskers**

Blair's Adjustable.....40  
 Blair's Adjustable Clipper.....40  
 Hubbard's Solid Steel.....40

**Indurated Fiber Ware**  
 See Ware, Indurated Fiber.

**Iron. Sad**

From 4 to 10, at factory.....100  
 Self-Heating.....20  
 Self-Heating Tailors'.....20  
 Mrs. Potts' Sad Irons, per set: No. 50.....65  
 No. 55.....65  
 No. 60.....65  
 No. 65.....65  
 No. 70.....65  
 No. 75.....65  
 No. 80.....65  
 No. 85.....65  
 No. 90.....65  
 No. 95.....65  
 No. 100.....65  
 No. 105.....65  
 No. 110.....65  
 No. 115.....65  
 No. 120.....65  
 No. 125.....65  
 No. 130.....65  
 No. 135.....65  
 No. 140.....65  
 No. 145.....65  
 No. 150.....65  
 No. 155.....65  
 No. 160.....65  
 No. 165.....65  
 No. 170.....65  
 No. 175.....65  
 No. 180.....65  
 No. 185.....65  
 No. 190.....65  
 No. 195.....65  
 No. 200.....65  
 No. 205.....65  
 No. 210.....65  
 No. 215.....65  
 No. 220.....65  
 No. 225.....65  
 No. 230.....65  
 No. 235.....65  
 No. 240.....65  
 No. 245.....65  
 No. 250.....65  
 No. 255.....65  
 No. 260.....65  
 No. 265.....65  
 No. 270.....65  
 No. 275.....65  
 No. 280.....65  
 No. 285.....65  
 No. 290.....65  
 No. 295.....65  
 No. 300.....65  
 No. 305.....65  
 No. 310.....65  
 No. 315.....65  
 No. 320.....65  
 No. 325.....65  
 No. 330.....65  
 No. 335.....65  
 No. 340.....65  
 No. 345.....65  
 No. 350.....65  
 No. 355.....65  
 No. 360.....65  
 No. 365.....65  
 No. 370.....65  
 No. 375.....65  
 No. 380.....65  
 No. 385.....65  
 No. 390.....65  
 No. 395.....65  
 No. 400.....65  
 No. 405.....65  
 No. 410.....65  
 No. 415.....65  
 No. 420.....65  
 No. 425.....65  
 No. 430.....65  
 No. 435.....65  
 No. 440.....65  
 No. 445.....65  
 No. 450.....65  
 No. 455.....65  
 No. 460.....65  
 No. 465.....65  
 No. 470.....65  
 No. 475.....65  
 No. 480.....65  
 No. 485.....65  
 No. 490.....65  
 No. 495.....65  
 No. 500.....65  
 No. 505.....65  
 No. 510.....65  
 No. 515.....65  
 No. 520.....65  
 No. 525.....65  
 No. 530.....65  
 No. 535.....65  
 No. 540.....65  
 No. 545.....65  
 No. 550.....65  
 No. 555.....65  
 No. 560.....65  
 No. 565.....65  
 No. 570.....65  
 No. 575.....65  
 No. 580.....65  
 No. 585.....65  
 No. 590.....65  
 No. 595.....65  
 No. 600.....65  
 No. 605.....65  
 No. 610.....65  
 No. 615.....65  
 No. 620.....65  
 No. 625.....65  
 No. 630.....65  
 No. 635.....65  
 No. 640.....65  
 No. 645.....65  
 No. 650.....65  
 No. 655.....65  
 No. 660.....65  
 No. 665.....65  
 No. 670.....65  
 No. 675.....65  
 No. 680.....65  
 No. 685.....65  
 No. 690.....65  
 No. 695.....65  
 No. 700.....65  
 No. 705.....65  
 No. 710.....65  
 No. 715.....65  
 No. 720.....65  
 No. 725.....65  
 No. 730.....65  
 No. 735.....65  
 No. 740.....65  
 No. 745.....65  
 No. 750.....65  
 No. 755.....65  
 No. 760.....65  
 No. 765.....65  
 No. 770.....65  
 No. 775.....65  
 No. 780.....65  
 No. 785.....65  
 No. 790.....65  
 No. 795.....65  
 No. 800.....65  
 No. 805.....65  
 No. 810.....65  
 No. 815.....65  
 No. 820.....65  
 No. 825.....65  
 No. 830.....65  
 No. 835.....65  
 No. 840.....65  
 No. 845.....65  
 No. 850.....65  
 No. 855.....65  
 No. 860.....65  
 No. 865.....65  
 No. 870.....65  
 No. 875.....65  
 No. 880.....65  
 No. 885.....65  
 No. 890.....65  
 No. 895.....65  
 No. 900.....65  
 No. 905.....65  
 No. 910.....65  
 No. 915.....65  
 No. 920.....65  
 No. 925.....65  
 No. 930.....65  
 No. 935.....65  
 No. 940.....65  
 No. 945.....65  
 No. 950.....65  
 No. 955.....65  
 No. 960.....65  
 No. 965.....65  
 No. 970.....65  
 No. 975.....65  
 No. 980.....65  
 No. 985.....65  
 No. 990.....65  
 No. 995.....65  
 No. 1000.....65

**Soldering**

Soldering Coppers.....19  
 Covert's Adjustable, list Jan. 1, 1886.....35  
 Tinker's Dread.....40  
 Pinking Irons, per doz.....55

**Jack Screws**—See Screws.

**Jacks, Wagon**

Daisy.....30  
 Victor.....30  
 Lockport.....40

**Kettles**

Brass, Spun, Plain, list Jan. 1, '91, 25&5  
 Brass, Spun, Plid. W. M. list Jan. 1, '91, 20  
 Stamped Brass Kettles.....21  
 Enamelled and Tea—See Ware, Hollow.

**Keys**

Look Ass'n list Dec. 30, 1886.....65  
 Eagle, Cabinet, &c.....30  
 Hotchkiss' Brass Blanks.....40  
 Hotchkiss' Copper and Tinned.....40  
 Hotchkiss' Pad. and Cab.....35  
 Wollensak Tinned.....60

**Knife Sharpeners**  
 See Sharpeners, Knife.

**Knives**  
**Butcher, Shoe, &c.**

Wilson's Butcher Knives, list Dec. 8, 1890.....25  
 Ames' Butcher Knives.....25  
 Foster Bros' Butcher, &c.....40  
 Jordan & A. J. Butcher's, list.....40  
 Nichols' Butcher Knives.....40  
 W. W. Wilson, Butcher, 6 in., \$2.00; 7 in., \$2.70; 8 in., \$3.80, &c.....30  
 Ames' Shoe Knives.....30  
 Ames' Bread Knives, per doz.....15  
 Moran's Shoe and Iron.....20  
 Hay and Straw—See Hay Knives.  
 Table and Pocket—See Cutlery.

**Corn**

Bradley's.....10  
 Wadsworth's.....25

**Drawing**

Witherby.....75  
 P. S. & W.....75  
 Mix.....75  
 New Haven.....75  
 Merr.....75  
 Wadsworth.....75

L. & J. White.....20  
 Bradley's.....35  
 Adjustable Handle.....25  
 Wilkinson's Folding.....25

**Hay and Straw**

Lighting, from jobbers.....\$8.00  
 Wadsworth's.....40  
 Carter's Needle.....40  
 Heath's.....40  
 Nolin's Hay.....40

**Mincing**

Am. (2d quality), per gr, 1 blade, \$7 net  
 2 blades, \$12; 3 blades, \$18.....20  
 Lohrop's.....20  
 Smith's, per doz, Single, \$2; Double \$3.....45  
 Knapp & Cowles.....50  
 Buffalo Adjustable.....40

**Knobs**

Door, Mineral.....60  
 Door, Por. Jap'd.....70  
 Door, Por. Nickel.....22  
 Door, Por. Plated Nickel.....22  
 Drawer, Porcelain.....60  
 Hemlock Door Knobs.....40  
 Yale & Towne Wood, list Dec. 1, 1885.....40  
 Base, Rubber Tip.....70  
 Picture, Judd's.....60  
 Picture, Sargent's.....70  
 Picture, Hemlock.....35  
 Shutter, Porcelain.....65  
 Carriage, Jap.....40  
 Bardley's Wood Door, Shutter, &c.....15

**Ladders**

Davies Extension and Single.....20

**Ladies**

Melting, Sargent's.....60  
 Melting, Reading.....35  
 Melting, P. S. & W.....35  
 Melting, Warner's.....30

**Lanterns**

**Tubular**  
 Regular, with Guard.....40  
 O. K., with Guard.....40  
 Side Lift, with Guard.....40  
 Square Lift, with Guard.....40  
 Anti-Friction, with Guard.....40  
 Brass Plated, Sq. Lift, Guard.....40  
 Cop. Plated, Sq. Lift, Guard.....40

**Bull's Eye Police**

2 1/2-inch regular.....40  
 3-inch regular.....40  
 3-inch flash light.....40  
 3-inch flash light.....40

**Lawn Mowers**  
 See Mowers, Lawn.

**Leaders, Cattle**

Humason, Beckley & Co.'s.....70  
 Sargent's.....70  
 Hotchkiss.....30  
 Peck, Stow & W. Co.....60

**Lemon Squeezers**  
 See Squeezers, Lemon.

**Lifters, Transom**

Wollensak's:  
 Class 3 and 4, Bronzed Iron.....60  
 Class 3 and 4, Bronze Metal.....50  
 Class 3 and 4, Brass.....50  
 Skylight Lifters.....35  
 Reiter's, list Feb. 20, 1891.....60  
 Bronzed Iron Rods.....60  
 Brass, Real Bronze or Nickel Plate.....30  
 Excelsior.....50  
 Shaw's.....50

**Lines**

Cotton and Linen Fish.....50  
 Mason's Linen, 3/4 ft. No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....25  
 Cotton Chalk.....55  
 Samson Cotton, No. 4, \$2; No. 4 1/2, \$2.50.....40

Silver Lake, Braided No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 4 1/2, \$8.50; No. 5, \$9.00; No. 5 1/2, \$9.50; No. 6, \$10.00; No. 6 1/2, \$10.50; No. 7, \$11.00; No. 7 1/2, \$11.50; No. 8, \$12.00; No. 8 1/2, \$12.50; No. 9, \$13.00; No. 9 1/2, \$13.50; No. 10, \$14.00; No. 10 1/2, \$14.50; No. 11, \$15.00; No. 11 1/2, \$15.50; No. 12, \$16.00; No. 12 1/2, \$16.50; No. 13, \$17.00; No. 13 1/2, \$17.50; No. 14, \$18.00; No. 14 1/2, \$18.50; No. 15, \$19.00; No. 15 1/2, \$19.50; No. 16, \$20.00; No. 16 1/2, \$20.50; No. 17, \$21.00; No. 17 1/2, \$21.50; No. 18, \$22.00; No. 18 1/2, \$22.50; No. 19, \$23.00; No. 19 1/2, \$23.50; No. 20, \$24.00; No. 20 1/2, \$24.50; No. 21, \$25.00; No. 21 1/2, \$25.50; No. 22, \$26.00; No. 22 1/2, \$26.50; No. 23, \$27.00; No. 23 1/2, \$27.50; No. 24, \$28.00; No. 24 1/2, \$28.50; No. 25, \$29.00; No. 25 1/2, \$29.50; No. 26, \$30.00; No. 26 1/2, \$30.50; No. 27, \$31.00; No. 27 1/2, \$31.50; No. 28, \$32.00; No. 28 1/2, \$32.50; No. 29, \$33.00; No. 29 1/2, \$33.50; No. 30, \$34.00; No. 30 1/2, \$34.50; No. 31, \$35



Britain, Graham & Mathes, list Jan. 1890.....60&10&10%  
 Plate.....33&42%  
 Barnes Mfg. Co.....40&40&10%  
 Yale.....net prices  
 Deltz Star Key.....38%  
 Romer's Night Latches.....15%  
 Brooklyn Latches.....60&10%  
 Warner's Burglar-Proof, # doz. \$8.00, 50%  
 Elevator—  
 Moore's.....38%&4

**Padlocks—**  
 List June 10, 1891.....50&2%  
 Norwich Lock Mfg. Co., old list.....50&2%  
 Yale Lock Mfg. Co.'s.....net prices  
 Eagle.....40%  
 Eureka, Eagle Lock Co.....40&2%  
 Romer's Nos. 0 to 91.....30%  
 Romer's Scandinavian, &c., Nos. 100 to 606.....15%  
 A. E. Deltz.....40%  
 Champion Padlocks.....40%  
 Hotchkiss.....30%  
 Star.....60%  
 Horseshoe.....# doz \$9.50@50&10%  
 Barnes Mfg. Co.....40&40&10%  
 Nook's.....30%  
 Scandinavian.....60&40%  
 E. T. Fraim's Keystone Scandinavian.....9 240%  
 100 line.....90&25%  
 120 line.....90&25%  
 109 line.....65%  
 510 line.....70&10%  
 225, 610 and 209 lines.....70%  
 All other numbers.....50&5%  
 Ames sword Co., up to No. 150.....40%  
 Ames sword Co., above No. 150.....50%  
 Slaymaker, Barry & Co.  
 No. 1010 line.....90&5%  
 No. 41 line.....50%  
 No. 64 line.....60%  
 No. 21 line.....30%  
**Sash, &c.—**  
 Clark's No. 1, 10; No. 2, 8 gr.....33&4%  
 Ferguson's.....33&4%  
 Victor.....60&10&2%  
 Walker's.....10%  
 Attwell Mfg. Co.....25&33&4%  
 Reading.....60%  
 Hammond's Window Springs.....10&10%  
 Common Sense, Jap'd, Cop'd and Br'zed.....# gr \$4.00  
 Common Sense, Nickel Plated.....# gr \$10.00  
 Universal.....30%  
 Kempshall's Gravity.....60%  
 Kempshall's Model.....60&60&10%  
 Corbin's Daisy, list Feb. 15, 1888.....60&10&10%  
 Payson's Perfect.....60&10&10%  
 Huginin's Sash Balances.....25&5&2%  
 Huginin's New Sash Locks.....25&5&2%  
 Ives' Patent.....60&10&5&10&10%  
 Fish (Jeschke's pat.), No. 100, # gr, \$3; No. 105, # gr, \$10.....60%  
 Davis Bronze, Barnes Mfg. Co.....60%  
 Champion Safety, list January, 1893, 70&5%  
 Security.....70%  
 Giant, list Jan., 1892.....70&5%  
 Wolcott's.....60&10&5%  
 Monarch.....50%

**Lumber Tools—**  
 See Tools, Lumber.  
**Lustro—**  
 Four-ounce bottles.....# doz, \$1.75; # gross.....\$17.00  
**Machines.**  
**Boring—**  
 Without Augers Upright, Angular.  
 Douglas.....\$5.50 to \$7.50.....50%  
 Snell's, Rice's Pat., 5.50 6.75 40&10&10%  
 Jennings.....5.50 6.75 45&45&10%  
 Other machines.....2.35 2.75.....50%  
 Phillips' Patent with auger.....7.00 7.50.....25%  
 Miller's Falls.....7.50.....25%  
 Buss, Carpenters.....3.85.....30%  
 Buss, Ship Builders.....3.85.....30%  
**Fluting—**  
 Knox, 4 1/2-inch Rolls.....\$3.25 each 35%  
 Knox, 6-inch Rolls.....\$3.60 each 35%  
 Eagle, 3 1/2-inch Rolls.....\$2.15.....35%  
 Eagle, 5 1/2-inch Rolls.....\$2.35.....35%  
 Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each.....35%  
 Crown Jewel, 6 in.....\$3.50 each, 35%  
 American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35%  
 Domestic Fluter.....each, \$1.50  
 Geneva Hand Fluter, White Metal.....# doz \$12.25  
 Crown Hand Fluter, No. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25.....30%  
 Shepard Hand Fluter, No. 85, per doz \$15.50.....40%  
 Shepard Hand Fluter, No. 110, # doz \$11.00.....40%  
 Shepard Hand Fluter, No. 95, # doz \$3.00.....40%  
 Combined Fluter and Sad Iron.....# doz \$15.00.....30%  
**Holisting—**  
 Moore's Hand Holist, with Lock Brake, 20%  
 Moore's Anti-Friction Differential Pulley block.....20%  
 Moore's Rope Differential Pulley block.....20%  
 Energy Mfg. Co.'s.....25%  
 See also Blocks.  
**Washing—**  
 Anthony Wayne, # doz, No. 1, \$42; No. 2, \$30; No. 3, \$42.....# doz \$36.00  
 Wayne American.....# doz \$36.00  
 Western Star # doz, No. 2, \$30; No. 3, \$39.....# doz \$54.00  
 Fair and Square.....# doz \$42.00  
**Mallets—**  
 Hickory.....20&10&20&10&10%  
 Lignumvitae.....20&10&20&10&10%  
 B. & L. Block Co., Hickory & L. V.....30&30&10%  
**Mattocks—**Regular list.....60&10&60&10&5%

**Measures—**  
 Standard Fireware, No. 1, peck # dozen, \$3.50; # peck, \$3.00  
**Meat Cutters—**  
 See Cutters, Meat.  
**Menders, Harness—**  
 Per doz.....\$2.00  
**Milk Cans—**See Cans, Milk.

**Mills—**  
**Coffee—**  
 Box and Side, list Jan. 1, 1888.....60&60&5%  
 Net prices are often made which are lower than above discount.  
 American, Enterprise Mfg. Co., list Jan. 17, 1888.....30%  
 The Swift, Lane Bros.....30%  
 Waddell's New Box Mills, Ideal Brand, New List.....60%

**Mincing Knives—**  
 See Knives, Mincing.  
**Molasses Gates—**  
 See Gates, Molasses.  
**Money Drawers—**  
 See Drawers, Money.  
**Mowers, Lawn—**  
 Best Machines: 10-in., \$4; 12-in., \$4.50; 14-in., \$5; 16 in., \$5.50; 18-in., \$6  
 Low-Grade Machines:  
 10-in. \$3; 12-in., \$3.25 14-in., \$3.50 each  
**Muzzles—**  
 Safety.....# doz, \$3.00, 25%

**Nails—**  
 Cut and Wire. See Trade Report.  
 Wire Nails, Papered.....85&5%  
 Association list, May 1, '92.....70&5%  
 Tack Mfrs' list.....70&5%  
 Hungarian, Finishing, Upholsterers', &c. See Tacks.  
**Horse—**  
 Nos. 6 7 8 9 10  
 American.....9 1/2 9 1/4 9 1/8 9 1/4.....net  
 Ausable.....28 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1.....40&5&2%  
 Clinton, Fin., 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1.....40&5&2%  
 Essex.....28 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1.....40&5&2%  
 Lyra.....9 1/2 9 1/4 9 1/8 9 1/4.....net  
 Snowden.....9 1/2 9 1/4 9 1/8 9 1/4.....net  
 Standard.....23 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1.....35%  
 Vulcan.....23 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1.....35%  
 Northwest'n.....25 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1.....25&25&5%  
 C. B. K.....25 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1.....40%  
 A. C.....25 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1.....40&10%

**Picture—**  
 Brass Head, Sargent's list.....60&60&10%  
 Brass Head, Combination list.....50&10%  
 Porcelain Head, Sargent's list.....50&10%  
 Porcelain Head, Combination list.....40&10%  
 Niles' Patent.....40%  
**Nail Pullers—**See Pullers, Nail.  
**Nail Sets—**See Sets, Nail.  
**Nut Crackers—**  
 See Crackers, Nut.  
**Nuts—**List Dec. 18, 1899.

**Oil Tanks—**See Tanks, Oil.  
**Oilers—**  
 Zinc and Tin.....65&10&70&5%  
 Brass and Copper.....50&10&50&10&5%  
 Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40 do doz.....10&10&5%  
 Malleable, Hammers' Old Pattern, same list.....45%  
 Prior's Pat. or "Paragon" Zinc.....60&10&10%  
 Prior's Pat. or "Paragon" Brass.....50%  
 Olmstead's Tin and Zinc.....60%  
 Olmstead's Brass and Copper.....60%  
 Broughton's Zinc.....60%  
 Broughton's Brass.....50%  
 Steel, Draper & Williams.....50%  
**Openers, Can—**  
 Messenger's Comet.....# doz \$3.00, 25%  
 American.....# gross \$2.75@3.00  
 Duplex.....# doz 25¢, 15¢  
 Lyman's.....# doz \$3.75, 20%  
 No. 4, French.....# doz \$2.25, 45¢  
 No. 5, Iron Handle.....# gr \$6.00, 45¢  
 Eureka.....# doz \$2.50, 10%  
 Sardine Scissors.....# doz \$2.75@3.00  
 Star.....# doz \$2.75  
 Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50.....65¢@70%  
 Excelsior, No. 1 \$2.50; No. 2, \$1.50.....40%  
 World's Best # gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.....50&10%  
 Universal, # doz \$3.00.....55&5%  
 Domestic, # doz \$2.00.....45%  
 Champion, # doz \$2.00.....45%  
 Moore's.....70%

**Packing, Steam—**  
**Rubber—**  
 Standard.....70&70&10%  
 Extra.....60&60&5%  
 N. Y. B. & P. Co., Standard.....50%  
 N. Y. B. & P. Co., Empire.....60%  
 N. Y. B. & P. Co., Salamander.....25%  
 Jenkins' Standard, # 80¢.....25&25&5%  
**Miscellaneous—**  
 American Packing.....10¢@11¢ #  
 Russia Packing.....13¢@14¢ #  
 Italian Packing.....15¢@16¢ #  
 Cotton Packing.....15¢@17¢ #  
 Jute.....7¢@8¢ #  
**Pails—**  
**Creamery—**  
 S. S. & Co.: 18-qt., \$7.00; 20-qt., \$7.25  
 or doz.....5%

**Galvanized—**  
 Quarts 10 12 14  
 Hill's Light Weight, # doz, \$2.75 3.00 3.25  
 Hill's Heavy Weight, # doz, 3.00 3.25 3.75  
 Helwig's.....2.50 2.75 3.00  
 Sibley, Shepard & Co.....2.50 2.75 3.00  
 Iron Closets.....2.50 2.75 3.00  
 Fire Buckets.....2.75 3.25 3.50  
 Buckets—See Well Buckets.

**Indurated Fiber Ware—**  
 Star Pails, 12 qt.....# doz \$4.20  
 Milk, 14 qt.....# doz \$5.40  
 Stable, 14 qt.....# doz \$6.00  
 Fire Pails, deep.....# doz \$4.80  
 Fire Pails, round bottom.....# doz \$5.40  
**Standard Fiber Ware—**  
 Water Pails, 12 qt., # doz, \$3.15 \$3.75  
 Dairy Pails, 14 qt., # doz, 3.75 4.25  
 Fire Pails, No. 1, 12 qt., # doz, 3.75 4.25  
 Fire Pails, No. 2, 14 qt., # doz, 4.25 5.00  
 Sugar Pails.....5.50 6.00  
 Horse Pails.....4.50  
 Buggy Pails.....8.50  
 Slop Jars (bal. trap).....7.50 8.50  
 Chamber Pails, 14 qt.....6.00 7.00

**Pans—**  
**Dripping—**  
 Small sizes.....# 5 1/2  
 Large sizes.....# 6 1/2  
 Silver & Co. (Covered).....40%  
**Fry—**  
 Standard list:  
 No.....0 1 2 3 4  
 # doz, \$3.00 \$3.75 \$4.25 4.75 \$5.25  
 No.....5 6 7 8  
 # doz.....\$6.00 \$7.00 \$8.00 \$9.00  
 Polished, regular goods.....75¢@75¢@10%  
 Acme Fry Pans.....65¢@5%  
**Dust—**  
 Steel Edge, No. 1.....# doz \$1.75  
**Roasting and Baking—**  
 Columbian, S. S. & Co.: Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each.....60&10%

**Paper and Cloth—**  
**Sand and Emery—**  
 List April 19, 1888.....50&10&50&10&10%  
 Sibley's Emery and Crocus Cloth.....30%  
**Parers—**  
**Apple—**  
 Advance.....# doz \$4.75  
 Baldwin.....# doz 5.25  
 Bonanza.....each 5.00  
 Dandy.....# doz 4.00  
 Eclipse.....# doz 4.00  
 Eureka, 1888.....each 16.00  
 Family Day State.....# doz 12.00  
 Favorite.....# doz 5.00  
 Gold Medal.....# doz 4.00  
 Ideal.....# doz 4.00  
 Improved Bay State.....# doz \$7.00@8.00  
 Little Star.....# doz 4.50  
 Monarch.....# doz 13.50  
 New Lightning.....# doz 5.50  
 Oriole.....# doz 4.00  
 Penn.....# doz 3.00  
 Perfection.....# doz 4.00  
 Pomona.....# doz 4.00  
 Rocking Table.....# doz 6.00  
 Turn Table.....# doz 4.50  
 Victor.....# doz 13.50  
 Waverly.....# doz 4.00  
 White Mountain.....# doz 4.00  
 Reading 72.....# doz 4.25  
 Reading 78.....# doz 7.00

**Potato—**  
 White Mountain.....# doz \$4.50  
 Antin Combination.....# doz \$5.50  
 Hooster.....# doz \$13.50  
 Saratoga.....# doz \$5.50  
**Pencils—**  
 Faber's Carpenters'.....high list 50%  
 Faber's Round Gift.....# gro \$5.25  
 Dixon's Lead.....# gro \$4.50  
 Dixon's Pencil.....# gro \$6.75  
 Dixon's Carpenters'.....10%  
**Pencils, Soapstone—**  
 See Crayons.  
**Pickers, Fruit—**  
 Prize Fruit Pickers.....50%  
**Picks—**  
 Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60&10&60&10&10%  
**Picture Nails—**  
 See Nails, Picture.  
**Pinking Irons—**  
 See Irons, Pinking.  
**Pins—**  
**Bow—**  
 Humason, Beckley & Co.'s.....60&10%  
 Hargate & Co.'s, \$17 and \$18.....60&10%  
 Peck, Stow & W. Co.....50&10&50&10&5%  
**Curtain—**  
 Silvered Glass.....net  
 White Enamel.....net  
**Escutcheon—**  
 Iron, list Nov. 11, 1885.....50&10&50&10&5%  
**Pipe, Wrought Iron—**  
 List April 13, 1893.  
 1 1/2 and under, Plain.....57¢@10%  
 1 1/2 and under, Galv.....60&10%  
 1 1/2 and over, Plain.....67¢@10%  
 1 1/2 and over, Galv.....67¢@10%  
 Boiler Tubes, list Oct. 24, 1892.....65¢@10%  
 Casing, list Nov. 16, 1892.....52¢@10%  
 Inserted Joints Casing, list Nov. 16, 1892.....47¢@5%  
 Steel Boiler Tubes.....27¢@5%  
 Cold Drawn Seamless Steel Tubing.....50%  
**Planes and Plane Irons—**  
**Wood Planes—**  
 Molding.....40&10%  
 Bench, First quality.....45&10%  
 Bench, Second quality.....50&10%  
 Bailey's (Stanley R. & L. Co.).....50&10%  
**Iron Planes**  
 Bailey's (Stanley R. & L. Co.).....50&10%  
 Miscellaneous Planes (Stanley R. & L. Co.).....25&10%  
 Steers' Iron Planes.....50&50&5%  
 Meriden Mal. Iron Co.'s.....50&50&5%  
 Davis' Iron Planes.....50&50&5%  
 Birmingham Plane Co.....60&60&5%  
 Gage Tool Co.'s Self-Setting.....20&10&10%  
 Chaplin's Iron Planes.....60&50&5%  
 Sargent's.....60&60&10%  
 Standard Tool Co.....50&50&5%  
**Plane Irons—**  
 Butcher's.....\$5.00@5.35 to #  
 Buck Bros.....30.

**Auburn Thistle.....**30&10&30&10&10%  
 Ohio.....25%  
 Sandusky.....50&10%  
 L. & J. White.....25%  
 Stanley R. & L. Co.....50&10%  
**Plates—**  
 Felloe.....# 6¢@6 1/4¢

**Pliers and Nippers**  
 Button's Patent.....60%  
 Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 # doz.....40%  
 Humason & Beckley Mfg. Co. 50&50&10%  
 Lindsey's Giant.....33&4%  
 Gas Pliers, Custer's Nickel Plated.....60&5%  
 Eureka Pliers and Nippers.....40%  
 Russell's Parallel.....25%  
 P. S. & W. Cast Steel.....50%  
 P. S. & W. Timmers' Cutting Nipper.....40%  
 Carew's Pat. Wire Cutters.....10%  
 Morrill's Parallel, # doz \$12.00.....50%  
 Cronk's 5 in. \$15.00; 10 in. \$20.00.....50%  
 Cronk's Tool Pattern.....50&10&50%  
 Cronk's Carrier Pliers.....60&60&5%

**Plumbs and Levels—**  
 Regular list.....75&10&75&10&10%  
 Stanley's Duplex.....20&10%  
 Stanley's Handy.....30&10%  
 Disston's.....50%  
 Cook's.....40&10%  
 Pocket Levels.....70&10&70&10&10%  
 Davis Iron Levels.....50%  
 Davis Inclinator.....10&10%

**Poachers, Egg—**  
 Buffalo Steam Egg Poachers, # doz, No. 1, \$6.00; No. 2, \$9.00.....35%  
 Silver & Co., 6-Ring, # doz, \$4.00; 3-Ring.....\$2.00  
**Pokes, Animal—**  
 Bishop's I. X. L.....# doz \$3.00  
 Bishop's Monarch.....# doz \$4.50  
 Bishop's Pioneer.....# doz \$4.00  
 Bishop's American.....# doz \$3.00  
 Eagle, Double Stale.....# doz \$3.75  
 Eagle, Single Stale.....# doz \$3.75  
 Buckeye, Single Stale.....# doz \$3.75  
 Bolding.....# doz \$6.00  
 Metallic Horse Poke.....# doz, \$6.00  
**Police Goods—**  
 R. I. Tool Co., Handcuffs, \$15.00 # doz 10%  
 R. I. Tool Co., Leg Irons, \$35.00 # doz 10%  
 Tower's.....25%  
 Daley's Improved Handcuffs, 2 Hands, Polished, # doz, \$48.00; Nickleod, \$57.00; 3 hands, Polished, # doz, \$72.00; Nickleod, \$84.00.....25%  
 J. P. Lovell's Police Goods.....25%

**Polish—**  
**Metal—**  
 Prestoline.....80%  
 Prestoline Paste.....55&5%  
 Gaston's Silver Compound.....55&5%  
**Stove**  
 Joseph Dixon's.....# gro, \$6.00, 10%  
 Gem.....# gro, \$4.50, 10%  
 Gold Medal.....# gro, \$6.00, 5%  
 Lustron.....# gro, \$4.75  
 Ruby.....# gro, \$3.75  
 Rising Sun, 6 gro lots.....# gro \$5.50  
 Dixon's Plumbago.....# gro \$3.00  
 Boynton's Noon Day.....# gro \$13.00  
 Prior Pride Stove Polish, # gro Yates' Liquid, 2 8 50 10 gal \$ gal, \$0.30 70 50 50  
 Yates Standard Paste Polish, 10 lb cans, # 12 1/2  
 Jet Black.....# gro \$3.50  
 Japanese.....# gro \$3.50  
 Kreside.....# gro \$3.50  
 Diamond O. K. Enamel.....# gro \$10.00  
 Bonnell's Liquid Stove Polish, # gro \$5.00  
 Bonnell's Paste Stove Polish, # gro \$6.00  
 Black Eagle Benzine Paste, 5 and 10 lb cans.....12¢@  
 Black Jack Water Paste, 5 and 10 lb cans.....12¢@  
 Nickel Plate Paste.....# gro \$5.00  
 Crown Paste.....# gro \$7.50  
 Crown Paste in 5 and 10 lb pails, # 12 1/2  
 Black Flag.....# gro \$7.50  
 Black Flag, 5 and 10 lb pails.....# gro \$8.00  
 Black Flag, liquid, in bottles, # gro \$12.00  
 Diamond Rock Nickel Clean.....# gro \$10.00  
 Raven Liquid, 6 oz. bottles.....# gro \$5.00  
 Raven Liquid, 8 oz. bottles.....# gro \$5.00  
 Raven Water Polish, large boxes.....# gro \$7.50  
 Raven Paste in 5 lb. pails (cases of 6 pails), # 10 1/2

**Poppers, Corn—**  
 Round or Square.....# doz \$1.00; # gr \$3.00  
 1 1/2 qt.....# doz \$1.00; # gr \$3.00  
 2 qt.....# doz \$1.50; # gr \$4.00  
**Post Hole and Tree Augers and Diggers—**  
 See Diggers, Post Hole, &c.  
**Potato Parers—**  
 See Parers, Potato.  
**Pots—**  
**Glue—**  
 Tinned.....40&10&40&10&5%  
 Enamelled.....40&10&40&10&5%  
 Family, Howe's "Eureka".....40%  
 Family, L. F. O.'s "Handy".....50%

**Powder—**  
**In Canisters—**  
 Fine Sporting, 1 lb each.....0.60  
 Duck, 1 lb each......60  
 Rifle, 1 lb each......30  
 Rifle, 1/2 lb each......13  
**In Kegs—**  
 Rifle, 25 lb kegs.....\$3.50  
 Rifle, 12 1/2 lb kegs.....2.00  
 Rifle, 6 1/2 lb kegs.....1.15  
 Duck, 25 lb kegs.....11.00  
 Duck, 12 1/2 lb kegs.....5.75  
 Duck, 6 1/2 lb kegs.....3.00  
**Presses—**  
**Fruit and Jelly—**  
 Enterprise Mfg. Co.....35%  
 Shepard's Queen City.....40%  
 Silver & Co.....# doz \$7.75  
**Pruning Hooks and Shears—**See Shears.

**Pullers, Nail-**

Scranton, ..... \$ doz., \$18.00, 38%  
 Giant, No. 1, ..... \$ doz., \$18.00, 10%  
 Giant, No. 2, ..... \$ doz., \$18.00, 10%  
 Pelican, ..... \$ doz., \$24.00, 25%  
 Pelican, ..... \$ doz., \$24.00, 40%  
 Economy, ..... \$ doz., \$6.00

**Pulleys-**

Hot House, Avring, & Co., ..... 60%  
 Japanned Screw, ..... 60%  
 Brass Screw, ..... 70%  
 Japanned Side, ..... 60%  
 Moore's Side, Anti Friction, ..... 50%  
 Moore's Colling or End, Anti-Friction, ..... 50%  
 Moore's Dumb Waiter, Anti-Friction, ..... 50%  
 Moore's Electric Light, ..... 38%  
 Japanned Clothes Line, ..... 60%  
 Hay Fork, Solid Eye, \$4.00; Swivel, \$4.60 ..... 50%  
 Hay Fork, "Anti-Friction," 5 in. solid, \$4.70 ..... 50%  
 Hay Fork, "P" Common and Patent, ..... 50%  
 Rushed, ..... 20%  
 Hay Fork, Tarbox Pat. Iron, ..... 20%  
 Hay Fork, Reed's Self-Lubricating, ..... 60%  
 Hay Fork, Moore's Anti-Friction 5 in. Wheel, \$ doz., \$12.00 ..... 40%  
 Made Rack, ..... 40%  
 Tackle Blocks-See Blocks.  
 Shepard's Niagara, No. 25, \$ doz 23¢ net (Cash Auger Mortise) ..... 60%  
 Common Sense, ..... 60%  
 Empire, ..... 60%  
 Ideal, Nos. 2, 4, 10 & 15 } 30% less 1¢  
 Acme, ..... } doz net.  
 Star, ..... }  
 On bbl. lot, ..... }  
 Ideal, Nos. 25 and 55, \$ doz. 22¢ net.

**Pumps-**

Clister, Best Makers, ..... 60%  
 Pitcher Spout, Best Makers, ..... 67%  
 Pitcher Spout, Cheaper G'ds, 75¢/75¢10%

**Punches-**

Saddler's or Drive, good, \$ doz., 60¢/85¢  
 Bemis & Call Co.'s Cast Steel Drive, 50¢/55¢  
 Bemis & Call Co.'s Springfield Socket, 60¢  
 Spring, good quality, \$ doz., \$2.50/\$2.60  
 Spring, Leach's Pat., ..... 15¢  
 Bemis & Call Co.'s Spring, ..... 50¢/55¢  
 Bemis & Call Co.'s Check, ..... 55¢  
 Solid Timmers, P., S. & W. Co., \$ doz., \$1.44 ..... 55¢  
 Timmers' Hollow Punches, P., S. & W. Co., ..... 20¢/25¢  
 Rice Hand Punches, ..... 15¢  
 Avery's Revolving, ..... 40¢  
 Avery's Sawset and Punch-See Sawsets  
 Niagara Hollow Punches, ..... 20¢/25¢  
 Niagara Solid Punches, ..... 50¢

**Rail-**

Sliding Door, Wrt Brass, \$ b, 35¢, 40%  
 Sliding Door, Bronzed Wrt Iron, \$ ft., 7¢  
 Sliding Door, Iron, Painted, \$ ft., 4¢, 40%  
 Barn Door, Light, in. \$ 3¢  
 Per 100 feet, ..... \$2.00 2.50 3.10, 10%  
 B. D. for N. E. Hand, Small, Med. Large, ..... \$3.15 2.70 3.25 Net

**Rakes-**

Cast Steel, Association & Co., 70¢/70¢5¢2¢  
 Cast Steel, outside g'ds, 70¢/70¢5¢2¢  
 Malleable, ..... 70¢/70¢5¢2¢  
 Gibbs' Lawn Rake, \$ doz., \$4.00, 35¢  
 Gibbs' Canton Lawn Rake, \$ doz., \$3.75  
 Gibbs' Acme Lawn Rake, \$ doz., \$4.75  
 Gibbs' Favorite Lawn Rake, \$ doz., \$3.90  
 Gibbs' Crown Lawn Rake, No. 1, ..... \$ doz., \$4.90, No. 2, \$3.50, 40%  
 Onetda Lawn Rake, \$ doz., \$6.00  
 Fort Madison Prime Bow Brace, ..... 65¢  
 Peerless, ..... 65¢  
 Fort Madison Steel Tooth Lawn Rake, \$6.00 ..... 25¢

**Razors-**

J. B. Torrey Razor Co., ..... 20%  
 Wootenholme and Butcher, \$10 to 20, ..... Net  
 Jordan's AAAI, new list, ..... Net  
 Jordan's Old Faithful, new list, ..... Net  
 Galvanic, ..... \$ doz., \$15.00  
 Electric Cutlery Co., ..... Net  
 Campbell Cutlery Co., ..... Net

**Razor Straps-**

See Straps, Razor.

**Registers -**

Moore's Japanned, ..... 75%  
 Moore's Electroplated, ..... 70%  
 Moore's Bronze Finishes, ..... 70%  
 Moore's Solid Bronze, ..... 65%  
 Moore's Stove Pipe, ..... 33%

**Rings and Ringers-****Bull Rings-**

Union Nut Co., ..... 55%  
 Sargent's, ..... 75%  
 Hotchkiss' low list, ..... 30%  
 Humason, Beckley & Co.'s, 70¢/10%  
 Peck, Stow & W. Co.'s, 50¢/10%  
 Elrich Hdw. Co., White Metal, low list, 80¢/50¢10%

**Hog-**

Top of the Hill Rings, ..... \$ doz \$2.00  
 Top of the Hill Rings, ..... \$ doz \$1.25  
 Hill's Improved Rings, ..... \$ doz \$1.25  
 Hill's Old Style Rings, ..... \$ doz \$1.12%  
 Hill's Tongs, ..... \$ doz \$3.00  
 Hill's Rings, ..... \$ doz \$1.00  
 Perfect Rings, ..... \$ doz \$1.50  
 Perfect Rings, ..... \$ doz \$2.15/\$2.25  
 Blair's Hog Rings, ..... \$ doz \$2.00  
 Blair's Hog Rings, ..... \$ doz \$0.90/\$1.00  
 Champion Rings, ..... \$ doz \$2.00  
 Champion Rings, Double, ..... \$ doz \$2.25  
 Brown's Rings, ..... \$ doz \$1.50  
 Brown's Rings, ..... \$ doz \$1.15/\$1.25  
 Electric Hog Rings, ..... \$ doz \$1.50  
 Electric Hog Rings, ..... \$ doz \$2.00  
 Major Rings, ..... \$ doz \$1.25  
 Major Rings, ..... \$ doz \$2.00

**Rivets and Burrs-**

Norway Iron, list Nov. 17, '87, ..... 60%  
 Second quality, ..... 70%  
 Jopper, ..... 60%  
 Coppered Iron, Bettina Brand, ..... 50%  
 Coppered Iron, Bettina Brand, ..... 50%

**Rivet Sets-See Sets.****Roasting and Baking Pans-See Pans, Roasting and Baking.****Rods-**

Star, Brass, ..... 25¢/30%  
 Star, Black Walnut, ..... \$ doz 40%

**Rollers-**

Barn Door, Sargent's list, ..... 60%  
 Aime Moore's Anti-Friction, ..... 55%  
 Union Barn Door Roller, ..... 70%  
 Moore's Barn Door Stay, ..... 50%  
 Thompson Mfg. Co.'s Lawn Rollers, ..... 30%

**Rope-**The following prices are f.o.b., New York or factory, and are shaded 1/4¢/4¢ on large lots; terms, 1 1/2% for cash.  
 Manila, 7-16 in. diam. and larger, \$ 8 1/2  
 Manila, 1/4 in. and 5-16 in. \$ 8 1/2  
 Manila, Tarred Rope, \$ 8 1/2  
 Manila, Hay Rope, Medium, \$ 8 1/2  
 Sisal, 7-16 inch and larger \$ 7 1/2  
 Sisal, 1/4 in. and 5-16 in. \$ 7 1/2  
 Sisal, Hay Rope, \$ 7 1/2  
 Sisal, Tarred Rope, \$ 6 1/2  
 Sisal, Medium Lath Yarn, \$ 6 1/2  
 New Zealand, 7-16 in. & larger \$ 6 1/2  
 New Zealand, 1/4 in. and 5-16 in. \$ 6 1/2  
 New Zealand, Hay Rope, \$ 6 1/2  
 New Zealand, Tarred Rope, \$ 6 1/2  
 Cotton Rope, \$ 13 1/2  
 Jute Rope, \$ 6 1/2

**Wire-**

List February, 1892. All kinds, ..... 45%

**Rules-**

Boxwood, ..... 30¢/10¢/10¢/80¢/10¢/10¢  
 Ivory, ..... 50¢/10%  
 Starrett's Steel Rules and Straight Edges, ..... 25¢/10%

**Sad Irons-See Irons, Sad.****Sand and Emery Paper and Cloth-See Paper and Cloth.****Sash Cord-See Cord, Sash.****Sash Locks-See Locks, Sash.****Sash Weights-See Weights, Sash.****Sausage Stuffers or Fillers-See Stuffers or Fillers, Sausage.**

Note.-Extra 5¢/10% often given.

**Saws-**

Disston's Circular, ..... 45¢/45¢5¢  
 Disston's Cross Cut, list Jan. 1, '93, 40¢/10%  
 Disston's Hand, ..... 25%  
 Woodruff & McFarlin, ..... 25%  
 Hand, Panel and Rip, ..... 25¢/10%  
 Cross Cuts, list Jan. 1, 1893, ..... 45¢/10%  
 Wheeler, Madden & Clemson Mfg. Co., ..... 30¢/10%  
 Hand, Panel and Rip, ..... 45¢/10%  
 Cross Cuts, list Jan. 1, 1893, ..... 45¢/10%  
 Atkins' Circular, ..... 50¢/10%  
 Atkins' Cross Cuts, new list, ..... 40%  
 Atkins' Mulay, Mill and Drag, ..... 50¢/10%  
 Atkins' One-Man Saw, ..... 40%  
 Atkins' Wood Saws, ..... 40%  
 Peace Circular and Mill, ..... 45¢/45¢5¢  
 Peace Hand Panel and Rip, ..... 25¢/25¢5¢  
 Peace Cross Cut, list Jan. 1, '93, ..... 45¢/10%  
 Richardson's Circular and Mill, 45¢/45¢5¢  
 Richardson's X Cuts, list Jan. 1, '93, 45¢/10%  
 Richardson's Hand, & Co., ..... 25¢/25¢5¢  
 C. E. Jennings & Co.'s, ..... 25%

**Hack Saws-**

Griffin's, complete, ..... 40¢/10¢/50¢  
 Griffin's Hack Saw Blades, ..... 40¢/10¢/50¢  
 Star Hack Saws and Blades, ..... 25%  
 Eureka and Crescent, ..... 25%

**Scroll-**

Lester, complete, \$10.00, ..... 25%  
 Rogers, complete, \$4.00, ..... 25%  
 Builders' and Cab Makers' \$15.25, ..... 25%  
 Barnes' Scroll Saw Blades, ..... 35%

**Saw Frames-**

See Frames, Saw.

**Saw Sets-See Sets, Saw.****Saw Tools-See Tools, Saw.****Scales-**

Hatch, Counter, No. 171, good quality, \$ doz \$18.00/\$19.00  
 Hatch, Tea, No. 181, ..... \$ doz \$6.50/\$7.00  
 Union Platform, Plain, ..... \$2.10/\$2.20  
 Union Platform, Striped, ..... \$2.40/\$2.50  
 Chastillon's Grocers' Trip Scales, ..... 50%  
 Chastillon's Eureka, ..... 40%  
 Chastillon's Favorite, ..... 25%  
 Family Turnbells, ..... 30¢/30¢10%  
 Riehle Bros' Platform, ..... 40%

**Scale Beams-**

See Beams, Scale.

**Scissors, Fluting..... 45%****Scrapers-**

Adjustable Box Scraper (S. R. & L. Co.), \$6.00, ..... 30¢/10%  
 Box, 1 Handle, ..... \$ doz \$2.25/\$2.50  
 Box, 2 Handle, ..... \$ doz \$2.00/\$2.25  
 Deance Box and Ship, ..... 20¢/10%  
 Ship, Common, ..... 50¢/10¢/50¢  
 Ship, R. I. Tool Co., ..... \$ doz \$5.00 7¢  
 Ship, R. I. Tool Co., ..... 10%

**Screen Window and Door****Frames-See Frames****Screw Drivers-**

See Drivers, Screw.

**Screws-****Bench and Hand-**

Bench, Iron, ..... 55¢/10¢/55¢/10¢/10%  
 Bench, Wood, Beech, ..... \$ doz \$2.25  
 Bench, Wood, Hickory, ..... 20¢/10%  
 Hand, Wood, ..... 25¢/10¢/25¢/10¢/25%  
 Hand, Grand Rapids, list, ..... 35%

**Coach, Lag and Hand-Rail-**

Lag, Blunt Point, list Jan. 1, 1890, ..... 80¢/80¢10%  
 Coach and Lag, Gimlet Point, list Jan. 1, 1890, ..... 80¢/80¢5%  
 Hand Rail, Sargent's, ..... 70¢/10%  
 Hand Rail, H. & B. Mfg. Co., 70¢/10¢/75%  
 Hand Rail, Am. Screw, ..... 75%

**Jack Screws-**

Jack Screws, Millers Falls list, 50¢/50¢10%  
 Jack Screws, F. S. & W., ..... 35%  
 Jack Screws, Sargent, ..... 70%  
 Jack Screws, Stearns, ..... 40¢/40¢10%

**Cork-**

Humason & Beckley Mfg. Co., 40¢/10¢/50%  
 Williamson's, ..... 38¢/38¢5¢  
 Detroit Cork Screw Co., ..... 33%

**Machine-**

Flat Head Iron, ..... 65%  
 Round Head Iron, ..... 60%

**Wood-**

List January 1, 1891.  
 Flat Head Iron, ..... 70%  
 Round Head Iron, ..... 65%  
 Flat Head Brass, ..... 70%  
 Round Head Brass, ..... 65%  
 Flat Head Bronze, ..... 70%  
 Round Head, Bronze, ..... 65%  
 Rogers' Drive Screws, ..... 82%  
 Extra 10 or 10% often given.

**Scroll Saws-See Saws, Scroll.****Scythes-**

Grain, ..... 40¢/5¢/40¢/10%  
 Grass, ..... 40¢/10¢/50%

**Scythe Snaths-**

See Snaths, Scythe.

**Sets-****Awl and Tool-**

Alken's Sets, Awls and Tools, No. 20, \$ doz \$10.00, ..... 60¢/60¢5%  
 Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9 ..... 45%  
 Millers Falls ACJ Tool Hds., No. 1, \$2; 2, \$18, ..... 25%  
 Hammer, Hotchkiss, ..... \$ doz \$6.50  
 Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50 ..... 30¢/10%  
 Common Brad Sets, No. 42, \$10.50; No. 43, \$12.50, ..... 70¢/10¢5%  
 Cannon's Diamond Point, ..... \$ gr. \$12, 25%

**Nail-**

Square, ..... \$ gr. \$4.00/\$4.25  
 Round, ..... \$ gr. \$3.25  
 Buck Bros, ..... 27%  
 Cannon's Diamond Point, ..... \$ gr. \$12, 25%

**Rivet-**

Regular list, ..... 70%

**Saw-**

Stillman's Genuine, \$ doz \$5.00/\$7.75, ..... 40¢/5%  
 Stillman's Pattern, Hand, \$ doz \$3.25, ..... 40¢/5%  
 Cross Cut, \$6.50, ..... 55¢/55¢10%  
 Common Lever, \$ doz \$2.00, 45¢/50%  
 Morrill's, \$15.00, ..... 40¢/50%  
 No. 1, \$16.00, ..... 40¢/20%  
 Nos. 3 and 4, Cross Cut, \$23.00, 40¢/20%  
 No. 5, Mill, \$31.00, ..... 40¢/20%  
 No. 10, \$15.50, ..... 40¢/20%  
 Leach's, No. 0, \$3.00; No. 1, \$15, 15¢/20%  
 Nash's, ..... 20¢/10¢/20¢/10¢/20%  
 Hammer, Hotchkiss, ..... \$5.50, 10%  
 Hammer, Bemis & Call Co., new Pat. 45%  
 Bemis & Call Spring Hammer, ..... 30¢/5%  
 Bemis & Call Co.'s Plate, ..... 20%  
 Bemis & Call Co.'s Cross Cut, ..... 30¢/5%  
 Alken's Genuine, ..... \$13.00, 60¢/60¢10%  
 Alken's Imitation, ..... \$ doz \$3.00/\$3.25  
 Sargent's Pat. Lever, ..... 25%  
 Disston's Star, ..... 25%  
 Leopold, ..... 40¢/10¢/50%  
 Atkin's Lever, ..... \$ doz No. 1, \$6.00  
 Atkin's Criterion, ..... \$ doz No. 1, \$6.00  
 Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00, ..... 40¢/10¢/50%  
 Avery's Saw and Punch, ..... 40%  
 Kohler's Royal, ..... \$ doz \$7.00  
 Kohler's Giant Royal, ..... \$ doz \$12.00  
 Crescent, ..... \$ doz \$3.00  
 Lloyd's Acme, ..... \$ doz \$15, 40¢/10%  
 Taintor Positive, ..... \$ doz \$18, 50%

**Sharpeners, Knife-**

Larkins', ..... \$ doz \$6.00, 40%  
 Appewood Handles, ..... \$ doz \$9.00 40%  
 Rosewood or Cocobola, ..... \$ doz \$9.00 40%

**Shaves, Spoke-**

Iron, ..... 45%  
 Wood, ..... 30%  
 Bailey's (Stanley R. & L. Co.), ..... 40¢/10%  
 Stearns', ..... 30¢/10%  
 Cincinnati, ..... 25¢/10%  
 Goodell's \$ doz \$9.00, ..... 25%

**Shears-**

American (Cast) Iron, 75¢/10¢/75¢/10¢5%  
 Barnard's Lamp Trimmers, \$ doz \$3.75  
 Seymour's, list Dec. 1881, ..... 60¢/10¢/10¢/60¢/10¢/10%  
 Heinisch's, list Dec. 1881, ..... 60¢/10¢/10¢/60¢/10¢/10%  
 Heinisch's Tailor's Shears, ..... 33%  
 Cast Steel Trimmers, ..... 80¢/80¢10%  
 First quality, ..... 80¢/10¢/80¢/10%  
 Second quality, ..... 80¢/10¢/80¢/10%  
 Acme Cast Shears, ..... 10¢/10%  
 Diamond Cast Shears, ..... 10¢/10%  
 Victor Cast Shears, 75¢/10¢/75¢/10¢5%  
 Howe Bros. & Hulbert, Solid Forged Steel, ..... 40%  
 Hatch Cutlery Co., Solid Steel Forged, 60%  
 Davenport Cutlery Co., ..... 60¢/60¢10%  
 Claus brand, Nickered, same list, ..... 70%  
 Galvanic 3/4 to 9 in., \$ doz \$1.00 1/2 inch Electric Cutlery Co., Jap'd, ..... Net  
 Campbell Cutlery Co., Jap'd, ..... 75%  
 Nickel Plated, ..... 65%

**Timmers' Snips-**

Wrt. Handles, Steel Blades, ..... 20¢/20¢10%  
 Niagara Snips and Shears, ..... 20¢/10%  
 Cast Handles, Laid with steel, ..... 40%

**Pruning Shears and Hook**

Disston's Combined Pruning Hook and Saw, \$ doz \$12.00, 30¢/10%  
 Disston's Pruning Hook, \$ doz \$12.00, 30¢/10%  
 E. S. Lee & Co.'s Pruning Tools, 50¢/10¢/70%  
 Pruning shears, Henry's Pat., \$ doz, \$3.75/\$4.00  
 Henry's Pruning Shears, \$ doz, \$3.75/\$4.00  
 Wheeler, M. & C. Co., Combination, \$ doz \$12.00

Dunlap's Saw and Chisel, \$ doz \$8.50, 30%  
 J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.25, ..... 30%  
 F. S. & W. Co., ..... 60%  
 Levin Pruner No. 1, \$15.00 \$ doz, 15¢/25%  
 Levin Pruner No. 2, \$21.00 \$ doz, 40¢/25%

**Timmers', & Co.-**

Shears and Snips (P. S. & W.), ..... 30¢/35%  
 Snips, J. Mallinson & Co., ..... 35%

**Sheaves-****Sliding Door-**

M. W. Co., list July, 1888, 50¢/10¢/60¢5%  
 R. & E., list Dec. 18, 1885, ..... 55¢/25%  
 Corbin's list, ..... 60¢/10¢5%  
 Patent Roller, ..... 60¢/10¢5%  
 Patent Roller, Hatfield's, ..... 70%  
 Russell's Anti-Friction, list Dec. 1885, ..... 60%  
 Moore's Anti-Friction, ..... 50%

**Sliding Shutter-**

R. & E., list Dec. 18, 1885, ..... 60¢/10¢5%  
 Sargent's list, ..... 70%  
 Reading list, ..... 60¢/10¢10%

**Shells-**

First quality 4, 8, 10 and 12 gauge, 25¢/10¢5%  
 First quality Rival, Club and Climax brands, 14, 16 and 20 gauge (7¢/50¢) (40¢) ..... 20¢/10¢5%  
 Prize, ..... 40¢/25%  
 Star, Club, Rival and Climax Brands, ..... 35¢/10¢5%  
 Smokeless brand, 12, 10, 16 gauge, ..... 35¢/10¢5%  
 Trap brand, 12 and 10 gauge, 35¢/10¢5%  
 Selbold's Comb. Shot Shell, ..... 60¢/25%  
 Brass Shot Shells, 1st quality, ..... 60¢/25%  
 Brass Shot Shells, Club, Rival, Climax, ..... 65¢/25%

**Shells, Loaded-**

Standard List, July 19, 1890, ..... 40¢/10¢/10¢/40¢/10¢/5%  
 7¢ cash, 10 day &

**Ship Tools-**

L. & J. White, ..... 30¢/25%

**Shoes, Horse, Mule, &c.-****Horse-**

Burden's, Perkins', Phoenix, Standard, Diamond State, Bryden's Boss and Crescent, at factory, ..... \$4.00  
 Bryden's Frog Pressure, at factory, ..... \$5.00

**Mule-**

Add 1¢ per keg to above prices.

**Ox Wrought-**

Ton lots, ..... \$ b 0¢  
 1000 lb lots, ..... \$ b 0¢  
 500 lb lots, ..... \$ b 10¢

**Shot-**

Drop, up to B, 25-m bag, ..... \$1.45  
 Drop, up to B, 5-m bag, ..... 1.35  
 Drop, B and larger, 25-m bag, ..... 1.70  
 Drop, B and larger, 5-m bag, ..... .40  
 Buck and Chilled, 25-m bag, ..... 1.70  
 Buck and Chilled, 5-m bag, ..... 1.00  
 Dust Shot, 25-m bag, ..... 2.50  
 Dust Shot 5-m bag, ..... .45

**Shovels and Spades**

Ames' Shovels, Spades, &c., list Nov. 1, 1885, ..... 30%  
 NOTE.-Jobbers frequently give 5¢/7% extra on above.  
 Griffith's Black Iron, ..... 50¢/10%  
 Griffith's C. S., ..... 60¢/60¢5%  
 Griffith's Solid C., R. R. Goods, ..... 20%  
 St. Louis Shovel Co., ..... 20¢/20%  
 Hussey, Blans & Co., ..... 15%  
 Hubbard & Co., ..... 20¢/20%  
 Lehigh Mfg. Co., ..... 50¢/10%  
 H. M. Myers Co., ..... 30%  
 Payne Petterbone & Son, ..... 35%  
 Remington's Cowman's Pat., 40¢/10¢/50%  
 Rowland's Black Iron, 60¢/10¢/60¢5%  
 Rowland's Steel, ..... 60¢/50¢/10%  
 Terra Haute Shovel & ..... 25%

**Shovels and Tongs**



**Snaps, Harness, &c.**

Anchor (T. & S. Mfg. Co.)	50c
Fitch's (Cristobal)	50c
Hotchkiss	10c
Andrews	10c
Sargent's Patent Guarded	70c
German, new list	40c
Over	50c
Over, New Patent	50c
Over, New R. E.	50c
Covered Spring	40c
Over's Saddlery Works' Triumph	35c
John Prots Snaps	75c
Kelley & Woolworth's Steel Harness	50c

**Snaths**

Scythe	50c
--------	-----

**Soldering Irons**See *irons, Soldering.***Spittoons, Cuspidors, &c.**

Standard Fiberglass	
Cuspidors, 8 1/2 inch, # doz, No. 5, \$8; No. 12, \$9	
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, \$4	

**Spoke Shaves**See *Shaves, Spoke.***Spoke Trimmers**See *Trimmers, Spoke.***Spoons and Forks**

Tinned Iron

Basting, Gen. Stamp, Co.'s list	70c
Flat Table and Tea, Gen. Stamp, Co.'s list	70c
Buffalo, S. S. & Co.	35c

**Silver Plated**

4 months or 5 cash 30 days:	
Holmes & Edwards Silver Co.	40c
C. Rogers & Bros.	40c
Rogers & Bros.	40c
Reed & Barton	40c
Wm. Rogers Mfg. Co.	40c
Simpson, Hall, Miller & Co.	40c
Holmes & Edwards Silver Co.	40c
L. Boardman & Son	50c

**Miscellaneous**

Holmes & Edwards Silver Co.	
No. 87 Mexican Silver	50c
No. 80 Silver Metal	50c
No. 24 German Silver	50c
No. 50 Nickel Silver	50c
No. 49 Nickel Silver	50c
Wm. Rogers Mfg. Co.	50c
Rogers' Silver Metal	50c
18c Rogers' German Silver	60c
35c Rogers' Nickel Silver	60c
German Silver, Hall & Elton	50c
Nickel Silver	50c
Britannia	60c
Boardman's Nickel Silver, list July 1, 1891	60c
Boardman's Britannia Spoons, case lots	60c

**Spring**

Torrey's Rod, 99 in.	\$1.20
Warner's No. 1, # doz \$1.50; No. 2, \$3.40	
Sam (Coll), list April 19, 1888	20c
Star (Coll), list April 19, 1888	20c
Victor (Coll)	60c
Champion (Coll)	60c
Gowell's, No. 1, # doz \$1.00; No. 2, \$1.00	
Rubber, complete, # doz \$4.50	
Heracles	50c
Phoenix	35c

**Carriage, Wagon, &c.**

Elliptic, Concord, Platform and Half	
Cliff's Bolster Springs	25c

**Squares**

Steel and Iron	30c
Steel Plated	30c
Try Square and T Bevels	60c
Diston's Try Square and T Bevels	50c
Winterbottom's Try and Miter	30c
Starrett's Micrometer Caliper Squares	25c
Avery's Flush Bevel Squares	40c
Avery's Bevel Protractor	50c

**Squeezers**

Fodder	
Blair's	\$2.00
Blair's "Climax"	\$1.25

**Lemon**

oreolain Lined, No. 1	\$8.00
Wood, No. 2	\$3.00
Wood, Common	\$3.00
Dunlap's Improved	\$3.75
Sammis, No. 1, \$5.00; No. 2, \$3.12	
113 # doz	25c
Jennings' Star	\$2.50
The Boss	\$2.50
Dean's, Nos. 1, # doz \$5.50; 2, \$5.50	
1.90; Queen	\$2.50
Little Giant	50c
Kins	40c
Hotchkiss Straight Flash	\$2.00
Silver & Co., Glass	\$9.00

**Standard Fiber Ware**See *Ware, Standard Fiber.***Staples**

Barbed Blind, 1/2 in. and larger, # 7 7/8	
Barbed Blind, 1/2 in.	8c
Fence Staples, Galvanized	Same price
Fence Staples, Plain	See Trd. Rep
Grand Crossing Tack Co.'s list	75c

**Steelyards****Stocks and Dies**

Blacksmith's	
Waterford Goods	35c
Butterfield's Goods	35c
Lighting Screw Plate	25c
Reeco's New Screw Plates	25c
Reversible Ratchet	30c
Gardner	25c
Green River	25c

**Steps, Bench**

Horrell's, # doz, No. 1, \$10.00; No. 2, \$11.00	
Hotchkiss	40c
Hotchkiss, No. 1	40c

McGill's, # doz \$3.	10c
Cincinnati	25c
Terrell's Nos. 1 and 2, # doz, \$3; No. 3, \$3.00	
Millers Falls	30c
Stearns	20c

**Stones, Grind-See Grindstones.****Scythe Stones**

Pike Mfg. Co., list April, 1892

Cleveland Scythe Co., list No. 1892

**Oil Stones, &c.**

Pike Mfg. Co.

Hindustan No. 1, # 10

Sand Stone

Turkey Oil Stone, 4 to 8 in.

Lily White Washita

Rosy Red Washita

Washita Stone, Extra

Washita Stone, No. 1

Washita Stone, No. 2

Lily White Slips

Rosy Red Slips

Washita Slips, Extra

Washita Slips, No. 1

Arkansas Stone, No. 1, 3 to 5 1/2 in.

Arkansas Stone, No. 1 1/2 to 8 in.

Lake Superior

Lafayette Superior Slips

**Stove Polish**See *Polish, Stove.***Stretchers Carpet**

Cast Steel, Polished

Cast Iron, Steel Points

Socket

Bullard's

**Strops, Razor**

Genuine Emerson

Imitation

Torrey's

Badger's Belt and Com

Lamont Combination

Jordan's Pat. Padded, list Nov. 1, '89

Electric Cutlery Co

Campbell Cutlery Co

**Stuffer, Sausage**

Miles' Challenge, # doz \$20

Perry, # doz, No. 1, \$15.00; No. 1, \$21.00

Enterprise Mfg. Co., list Jan 17, '98

**Sweepers, Carpet and Lawn****Carpet**

Bissell No. 5

Bissell No. 8

Bissell, Grand

Standard

Domestic

Domestic, No. 2

Grand Rapids

Crown Jewel, No. 1, \$18.00; No. 2, \$19.00

Magie

Improved Parlor Queen

Nicoled

Japanned

Excelsior

Garland

Parlor Queen

Housewife's Delight

Ladies' Friend

Ladies' Friend No. 2

Advance

Our Leader

Triumph

Supreme

Easy Jap'd, # doz \$22.00; Nickel, \$24.00

Gilt Edge

Acme

Imperial

Grand Republic

Jap'd, # doz \$30.00; Nickel, \$33.00

Banner

The Star

Reliable

Rapid Jap'd, # doz \$22.00; Nickel, \$24.00

Our Own

Model

Goshen Sweeper Company, Grand Rapids, Mich., make the following re-

bates:

6 dozen in 6 months

10 dozen in 6 months

Exception L.F., when 10 dozen price is \$13.50, and 25 dozen \$13.00.

**Lawn**

Thompson Mfg. Co.

**Swings**

Davies Lawn

**Tacks, Brads &c.**

List October 19, 1889. Old established

straight weights. Short Weight goods

are sold at lower prices.

**Carpet Tacks**

American, Blued

American, Tind and Copp'd

Steel, Bright and Blued

Steel, Tinned and Coppered

Swedes Iron, Blued

Swedes Iron, Tinned

American Iron Tacks, Domestic

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

S. S., Tinned

Lanc., Blued

Lanc., Tinned

Gimp and Lace Tacks

S. S., Blued

## Whips

American Whip Co.	Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
X. L. Whalebone Driving	...	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Bureka, Two-thirds Whalebone	...	...	...	15.00	16.50	18.00	20.00	...	...
Bull Bone, Half-length Whalebone	...	...	...	...	...	...	...	...	...
American Standard	...	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center	...	6.00	6.00	6.50	7.00	7.50	8.00	...	...
New Name, Stocked Java, Black and Wine Colors	...	...	...	...	...	...	...	...	...
American, 98 Pen Whip	...	...	...	6.00	...	...	...	...	...
Gents' Light Driving No. 111	...	...	...	...	6.00	...	...	...	...
Gents' Light Driving No. 106	...	...	...	...	5.00	...	...	...	...
Hand-made Stocked Java No. 103	...	...	...	3.75	4.00	...	...	...	...
A large variety of cheaper grades	...	...	...	...	...	...	...	...	...
Top Whips	...	...	...	...	...	...	...	...	...
Hardware Assortment, 10/American, 75 Whips for \$50.00	...	...	...	...	...	...	...	...	...

## Wire and Wire Goods—

## Iron—

Market	Br. & Ann., Nos. 0 to 18	Extra 5/10% often given
Br. & Ann., Nos. 0 to 18	75¢10¢75¢10¢25¢	often given
Cop'd, Nos. 0 to 18	75¢10¢75¢10¢25¢	often given
Galv., Nos. 0 to 18	70¢25¢70¢10¢	prices often made on large lots.
Fin'd, Tin'd list, Nos. 0 to 18	70¢70¢10¢	

Stone, Br. and Ann'd,	Nos. 16 to 18	Extra 10% often given
Nos. 16 to 18	80¢25¢	often given
Nos. 19 to 26	80¢25¢	often given
Nos. 27 to 36	82¢25¢	often given
Tinned Broom Wire, 15 to 21	45¢	
Galvanized Fence	75¢10¢	
Brass, list Jan. 13, 1884	40¢25¢	
Copper, list Jan. 13, 1884	40¢25¢	
Ann'd Wire on Spools	60¢25¢	
Mallin's Ann'd & Tin'd on Spools	60¢25¢	
Mallin's Brass and Cop. on Spools	50¢25¢	
Ossawan Mills, Ann'd and Tinned on Spools	60¢10¢	

Ossawan Mills, Brass and Copper on Spools. 50¢10¢  
 Tate's Spooled, Tin'd & Annealed. 60¢25¢  
 Tate's Spooled Cop. and Brass. 50¢  
 Cast Steel Wire. 50¢  
 Stubs' Steel Wire. \$5.00 to 2, 30¢  
 Steel Music Wire, 12 to 30, imported. 60¢70¢

Wire Clothes Line, see Lines.  
 Wire Picture Cord, see Cord.

## Bright Wire Goods—

Standard list. 35¢10¢35¢10¢10¢

## Wire Cloth and Netting—

Painted Screen Cloth # 100 ft. \$1.75  
 Galvanized Wire Netting. 75¢75¢10¢

## Wire Barb—

See Trade Report.

## Wire Rope—See Rope, Wire.

## Wrenches—

American Adjustable. 40¢  
 Baxter's Adjustable "S". 40¢10¢50¢  
 Baxter's Diagonal. 80¢  
 Coe's Genuine. 50¢10¢  
 Coe's "Mechanic". 50¢10¢  
 Girard Standard. 65¢10¢70¢  
 Lamson & Sessions' Engineers. 60¢10¢  
 Lamson & Sessions' Standard. 70¢10¢  
 P. S. & W. Agricultural. 75¢10¢80¢  
 Girard Agricultural. 75¢10¢80¢  
 Lamson & Sessions' Agric'l. 75¢10¢80¢  
 W. & B. Diamond.

Bemis & Call's:  
 Pat. Combination Bright. 40¢25¢  
 Pat. Combination Black. 40¢10¢  
 Merrick's Pattern. 45¢  
 Briggs's Pattern. 50¢10¢  
 Cylinder or Gas Pipe. 45¢25¢  
 No. 3 Pipe. 55¢  
 Aiken's Pocket (Bright). 36.00, 50¢10¢  
 The Favorite Pocket. 7 dos., \$4.00, 40¢  
 Webster's Pat. Combination. 32¢  
 Boardman's. 30¢  
 Always Ready. 35¢25¢  
 Alligator. 30¢10¢  
 Donohue's Engineer. 50¢10¢  
 Eagle. 50¢10¢  
 Acme, Bright. 50¢25¢  
 Acme, Nickleled. 40¢25¢  
 Hercules. 70¢70¢25¢  
 Walker's. 55¢25¢  
 Diamond Steel. 55¢25¢  
 Cincinnati Brace Wrenches. 55¢10¢  
 Taft's Vise Wrench. 55¢10¢25¢

## Wringers, Clothes—

Am. Wringer Co.'s list July 1, '93. 25¢ cash  
 Colby Wringer Co. list Sept. 1, '91. 25¢ cash  
 Lovell Mfg. Co. list July 1, 1892. 25¢ cash  
 Peerless Mfg. Co., list Feb., 1892. 25¢ cash  
 National Wringer & Mfg. Co. list June 1, 1892. 25¢ cash

## Wrought Goods—

Staples, Hooks, &c., list March 17, 1893. 85¢10¢85¢15

## Paints, Oils and Colors.—Wholesale Prices.

## Animal and Vegetable

## Oils—

Linseed, City, raw, per gal.	40¢
Linseed, City, boiled	43¢
Linseed, Western, raw	40¢
Lard, City, Extra Winter	66¢
Lard, City, Prime	65¢
Lard, City, Extra No. 1	58¢
Lard, City, No. 1	50¢
Lard, Western, prime	65¢
Cotton-seed, Crude, prime	30¢
Cotton-seed, Crude, off grades	28¢
Cotton-seed, Summer Yellow, prime	39¢
Cotton-seed, Summer Yellow, off grades	37¢
Sperm, Crude	75¢
Sperm, Natural Spring	79¢
Sperm, Bleached Spring	84¢
Sperm, Natural Winter	85¢
Sperm, Bleached Winter	90¢
Whale, Crude	60¢
Whale, Natural Winter	55¢
Whale, Bleached Winter	58¢
Whale, Extra Bleached	59¢
Sea Elephant, Bleached	...
Winter	...
Menhaden, Crude, Sound	35¢
Menhaden, Crude, Southern	...
Menhaden, Light Pressed	33¢
Menhaden, Bleached Winter	43¢
Menhaden, Extra Bleached	46¢
Tallow, City, prime	60¢
Tallow, Western, prime	55¢
Cocoonut, Ceylon	51¢
Cocoonut, Cochila	61¢
Cod, Domestic	38¢
Cod, Foreign	42¢
Red Elaine	44¢
Red Saponified	54¢
Bank	37¢
Straits	38¢
Olive, Italian, bbls.	68¢
Neatsfoot, prime	75¢
Palm, prime, Lagos	73¢

## Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test	7 @ 7 1/2
Black, 29 gravity, 15 cold test	7 1/2 @ 8
Black, 29 gravity, summer	6 @ 6 1/2
Cylinder light, filtered	14 @ 16

Cylinder, dark, filtered	10 @ 13
Paraffine, 23 1/2 @ 24 gravity	11 @ 12
Paraffine, 25 gravity	10 @ 11
Paraffine, 28 gravity	7 1/2 @ 8
Paraffine, red	1 1/2 @ 10 1/2

## Paints and Colors—

Barytes, Foreign, 1 ton	\$22.00 @ 24.00
Barytes, Amer. floated	23.00 @ 23.00
Barytes, Amer. No. 1	16.00 @ 18.00
Barytes, Amer. No. 2	13.00 @ 15.00
Barytes, Amer. No. 3	11.00 @ 12.00
Blue, Celestial	6 @ 8
Blue, Chinese	40 @ 50
Blue, Prussian	25 @ 40
Blue, Ultramarine	8 @ 25
Brown, Spanish	3 1/2 @ 1
Brown, Vandyke, Amer.	3 @ 3 1/2
Brown, Vandyke, English	6 @ 8
Carmin, No. 40, in bulk	2.75 @ ..
Carmin, No. 40, in boxes	2.85 @ ..
Carmin, No. 40, in ounce bottles	3.75 @ ..
Chalk, in bulk	1.75 @ 2.00
Chalk, in bbls. # 100 lb.	33 @ 40
China Clay, English	13.00 @ 18.00
Cobalt Oxide, prep'd	9.00 @ 11.00
Cobalt Oxide, black	25 @ 40
Cobalt Oxide, lots 100 lb.	1.90 @ ..
Green, Paris, 170 @ 175 lb.	10 @ 10 1/2
Green, Paris, small pack	12 @ 11
Green, Chrome, ordinary	6 @ 12
Green, Chrom., pure	22 @ 25
Lead, Eng., B.B. white	8 1/2 @ 10
Lead, Ann. White, dry or in lumps	7 @ 7 1/2
Kegs, lots less than 500 lb.	6 1/2 @ 6 3/4
Kegs, lots 500 lb. to 5 tons	6 3/4 @ 6 3/4
Kegs, lots 5 tons to 12 tons	6 3/4 @ 6 3/4
Kegs, lots 12 tons and over	6 1/2 @ 6 1/2
Lead, White, in oil, 25 lb tin	.. @ 1 1/2
Lead, White, in oil, 12 1/2 lb tin	.. @ 1
Lead, White, in oil, 10 lb tin	.. @ 1
Lead, White, in oil, 10 lb tin assorted tins, add to keg price	.. @ 2 1/2
Lead, Red, bbls. and 1/2 bbls.	6 @ 7
Lead, Red, kegs	6 1/2 @ 7 1/2
Litharge, kegs	6 1/2 @ 7 1/2
Litharge, bbls. and 1/2 bbls.	6 @ 7

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle. 1.35 @ 1 1/2  
 Ocher, French Washed. 1 1/2 @ 2 1/2  
 Ocher, German Washed. 1 1/2 @ 3  
 Ocher, American. 1 1/2 @ 3  
 Orange Mineral, English. 8 1/2 @ 9  
 Orange Mineral, French. 10 @ 10 1/2  
 Orange Mineral, German. 8 1/2 @ 9  
 Orange Mineral, American. 8 1/2 @ 9  
 Paris White, English Cliff. 1.00 @ 1.15  
 Paris White, American. 65 @ 75  
 Red, Indian, English. 5 1/2 @ 7  
 Red, Indian, American. 2 @ 6 1/2  
 Red, Turkey. 9 @ 14  
 Red, Tuscan. 9 @ 11  
 Red, Venetian, American. 9 @ 11

Red, Venetian, English. 1.20 @ 1.35  
 Sienna, Italian, Burnt and Powder. 4 @ 5  
 Sienna, Ital., Burnt Lumps. 1 1/2 @ 3 1/2  
 Sienna, Ital., Raw, Powder. 4 1/2 @ 5 1/2  
 Sienna, Ital., Raw, Lumps. 1 1/2 @ 3 1/2  
 Sienna, American, Raw. 1 1/2 @ 1 1/2  
 Sienna, American, Burnt and Powdered. 1 1/2 @ 1 1/2  
 Talc, French. 1 1/2 @ 1 1/2  
 Talc, American. 1 1/2 @ 1 1/2  
 Terra Alba, Frch. # 100 lb. 95 @ 1.25  
 Terra Alba, English. 70 @ 80  
 Terra Alba, American No. 1. 65 @ 75  
 Terra Alba, American No. 2. 45 @ 50  
 Umber, Turkey, Burnt and Powdered. 3 1/2 @ 4  
 Umber, Turkey, Raw and Powdered. 2 1/2 @ 3  
 Umber, Turkey, R.W. Lumps. 2 1/2 @ 2 1/2  
 Umber, Turkey, R.W. Amer. 1 1/2 @ 1 1/2  
 Umber, Turkey, R.W. Amer. 1 1/2 @ 1 1/2  
 Yellow, Chrome. 10 @ 25  
 Vermilion, American Lead. 11 1/2 @ 12  
 Vermilion, Quicks'g, bulk. 57 @ ..  
 Vermilion, Quicks'g, bags. 58 @ ..  
 Vermilion, Quicks'g, sm'r pks. 62 @ ..  
 Vermilion, English Import. 85 @ 90  
 Vermilion, Imitation, Eng. 8 @ 35  
 Vermilion, Trieste. 90 @ 92 1/2  
 Vermilion, Chinese. 92 1/2 @ 95  
 Whiting Common, # 100 lb. 37 1/2 @ 42 1/2  
 Whiting Gliders. 45 @ 55

Zinc, American, dry. 4 @ 4 1/2  
 Zinc, French, Red Seal. 7 1/2 @ ..  
 Zinc, French, Green Seal. 9 @ ..  
 Zinc, French, V. M. X. 7 @ ..  
 Zinc, Antwerp, Red Seal. 7 1/2 @ ..  
 Zinc, Antwerp, Green Seal. 7 1/2 @ ..  
 Zinc, German, L. Z. O. 6 1/2 @ 7 1/2  
 Zinc, V. M. in Poppy Oil, Seal, lots of 1 ton and over. 10 1/2 @ 11 1/2  
 Zinc, V. M. in Poppy Oil, lots less than one ton. 11 @ 11 1/2  
 Zinc, Red Seal. 10 1/2 @ 11 1/2  
 Zinc, lots of 1 ton and over. 10 @ 10 1/2  
 Zinc, lots less than 1 ton. 10 1/2 @ 10 1/2  
 Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1 1/2 %; 25 bbls., 2 %; 50 bbls., 4 %. No discount allowed on less than bbl. lots.

Colors in Oil—  
 Black, Drop, Frankfort. 25 @ 30  
 Black, Drop, English. 12 @ 15  
 Black, Drop, Domestic. 7 @ 10  
 Black, Lampblack, Best. 20 @ 25  
 Black, Lampblack, Common. 7 @ 15  
 Black, Ivory. 8 @ 15  
 Blue, Chinese. 35 @ 40  
 Blue, Prussian. 20 @ 45  
 Blue, Ultramarine. 12 @ 18  
 Brown, Vandyke. 7 @ 13  
 Green, Chrome. 8 @ 13  
 Green, Paris. 16 @ 18 1/2  
 Sienna, Raw. 7 @ 14  
 Sienna, Burnt. 7 @ 14  
 Umber, Raw. 7 @ 10  
 Umber, Burnt. 7 @ 10

Putty—  
 In barrels and 1/2 bbls. 0.15¢ @ 0.15¢  
 In tubs. 0.15¢ @ 0.15¢  
 In tin cans. 0.15¢ @ 0.15¢  
 In bladders. 0.15¢ @ 0.15¢

Spirits Turpentine—  
 In regular bbls. 29¢ @ 29¢  
 In machine bbls. 30¢ @ 30¢

Glue—  
 Low Grade. 8 @ 10  
 Cabinet. 12 @ 14  
 Medium White. 13 @ 15  
 Extra White. 17 @ 20  
 French. 10 @ 22  
 English. 10 @ 15  
 Irish. 12 @ ..

## THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron and Metal Trades, and a standard authority on all matters relating to those branches of industry.

## RATES OF SUBSCRIPTION: INCLUDING POSTAGE.

## UNITED STATES AND BRITISH AMERICA.

Weekly Edition, Issued every THURSDAY MORNING	\$4.50 a year.
Semi-Monthly Edition, First and Third THURSDAYS of every month	2.30 "
Monthly Edition, First THURSDAY of every month	1.15 "

## RATES OF ADVERTISING: ONE SQUARE (12 LINES, ONE INCH).

ONE INSERTION	\$2.00
ONE MONTH	7.50
THREE MONTHS	17.50

New York (Main Office),	96-102 Reade Street,
Philadelphia,	220 South Fourth Street,
Pittsburgh,	Room 509, Hamilton Building.
Chicago,	59 Dearborn Street, cor. Randolph,
Cincinnati,	Rooms 22-24 Pickering Building,
St. Louis,	Bank of Commerce Building,
Boston,	146 Franklin Street,
Cleveland,	312 The Cuyahoga,

BRITISH AGENCY: Office of The Ironmonger, 42 Cannon St., London.

AUSTRALIAN OFFICES: Melbourne, 231 Elizabeth St.; Sydney, 234 Clarence St.

Remittances should be made by draft, payable to the order of DAVID WILLIAMS, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received. Newsdealers or Booksellers in any part of the world may obtain The Iron Age through The American News Company, New York, U. S. A. The International News Company, New York, U. S. A. and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-Class Matter.



---

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google<sup>TM</sup> books

<https://books.google.com>

